ORDER NO. VRD-8404-504

Service Manual

General Description
Adjustment Procedures
Block / Schematic Diagrams
Exproded Views / Parts List

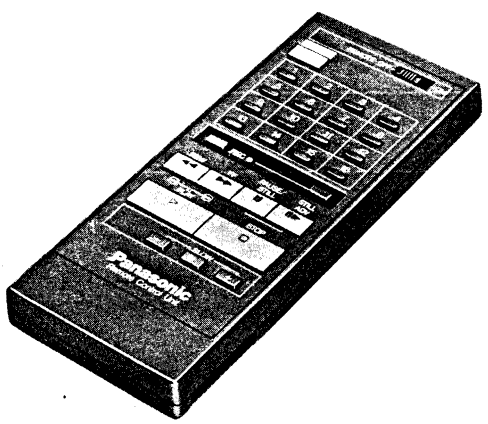
Video Tuner/Timer Adaptor

Panasonic VHS

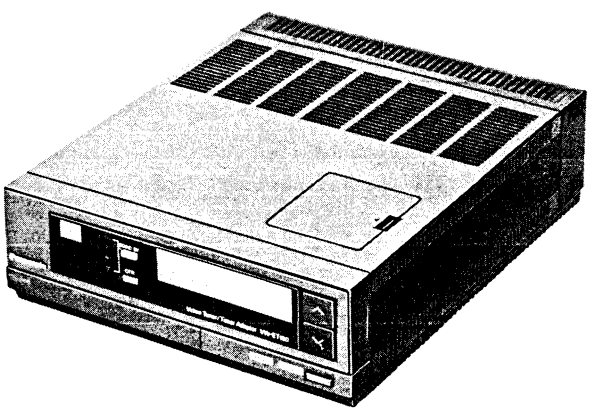
VW-ET180 E B EO

Wireless Remote Controller

VW-R18E



VW-R18



VW-ET180

Panasonic

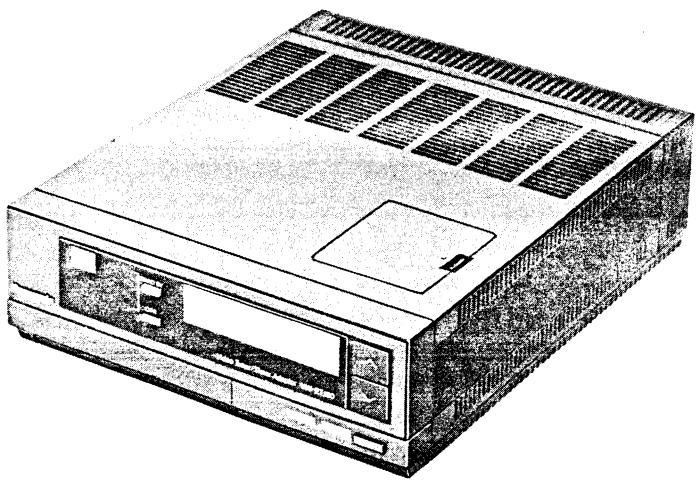
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TUNER INTRODUCTION

By implementing a large number of latest technological developments from a wide range of diverse fields, Panasonic succeeded in making a new portable NV-180 a standerd in terms of light weight and together with the Tuner/Timer VW-ET180 for TV programme recording.
This service manual contains technical information which will allows service technicians to understand service the Panasonic Tuner/Timer VW-ET180 and Infra-Red Remote Control Unit VW-R18.
VW-ET180 has many special features as shown following section.
These features in addition to the basic Tuner/Timer make the unit an ideal one for your culture and entertainment.

Video Tuner/Timer Adaptor

VW-ET180



SPECIFICATIONS

Power Source:	220 V (VW-ET180E/EO)
	240 V AC, 50/60 Hz (VW-ET180B)
Power Consumption:	Approx. 33 watts
Television System:	CCIR: 625 lines, 50 fields
	PAL colour signal
Timer:	14 day/8-programme timer with 1-hour battery back-up system
Input:	VW-ET180E
	VHF ch. 2—12.
	UHF ch. 21—69.
	VW-ET180B
	UHF ch. 21—69.
	VW-ET180EO
	VHF ch. E2—S3 (Low)
	M1—U9 (High)
	UHF ch. 21—69.
	75Ω unbalanced (DIN)
Output:	Video: Multi Connector 1.0 Vp-p, 75Ω terminated
	Audio: Multi Connector 130 mVp-p, 2.2 kΩ terminated
Weight:	3.0 kg
Dimensions:	215(W) × 69.5(H) × 27.3(D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

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1. FEATURES

1. One-Touch Timer Recording (OTR)

Simply by pressing the OTR Button between 2 and 5 times, the connected VTR can be programmed for 30, 60, 90 or 120 minutes of recording with immediate start.

2. Stand-by OTR Recording

By pressing the Stand-by Button between 1 and 4 times, the connected VTR can be programmed to begin recording in 30, 60, 90 or 120 minutes. By subsequently pressing the OTR Button repeatedly, a recording duration of 30, 60, 90 or 120 minutes can be selected for this deferred OTR recording.

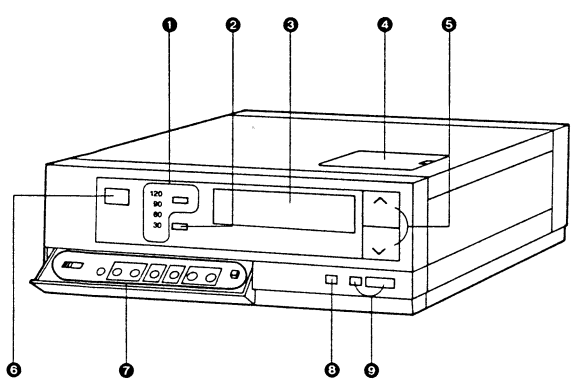
3. Recording One Programme While Watching Another

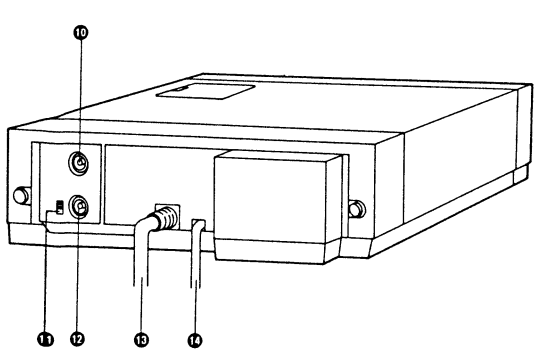
The built-in tuner allows you to record a programme that you don't want to miss while watching another programme.

4. 14-day/8 Programme Timer

The built-in timer allows automatic absentee recording of up to 8 TV programmes within 14 days. It is also possible to record a programme which is broadcast at the same time every day or every week.

2. CONTROLS AND COMPONENTS





❶ **Stand-by Button**
Press the STAND BY button repeatedly to select the time delay for OTR recording start.

❷ **OTR Button**
Automatic recording for 30, 60, 90 or 120 minutes is possible by pressing this button.

❸ **Time/Channel Display**
Indicates either the time/day or recording start/stop times for the timer recording, and indicates the selected channel.

❹ **Tuner Set-up Controls**
Tuning control for the any broadcast channel in your area.

❺ **Channel Up and Down Buttons**
Push the desired channel selector buttons to select the channel you wish to view or record.

❻ **Infra-red Remote Control Receiver**
Receiving the Infra-red Remote Control signal.

❼ **Timer Controls**
The timer controls are used to set the clock for the preset and to programme start and stop for timer recording.

❽ **Charging Indicator Lamp**
When the battery charging is completed, the charging lamp goes off.

❾ **Operating Switch/Indicator Lamp**
The Operating switch turns the unit ON and OFF. The indicator lamp illuminates while the unit is ON.

❿ **RF Output Socket**
For connection of TV antenna terminal with the DIN-DIN Coaxial Cable.

⓫ **RF Signal Level Switch**
Used to attenuate the reception of the VHF and/or UHF antenna signals.
If the reception is normal, set to "HIGH". If the signal strength is high and a stripped pattern appears at the top of the picture on TV, set to "LOW".

⓬ **RF Input Socket**
Connect the external aerial to the RF Input Socket.

⓭ **Adaptor Cable**
Use this Adaptor Cable for connection of the NV-180 Adaptor Socket.

⓮ **AC Mains Cord**

3. DISASSEMBLY METHOD

3-1. DISASSEMBLY FLOW CHART

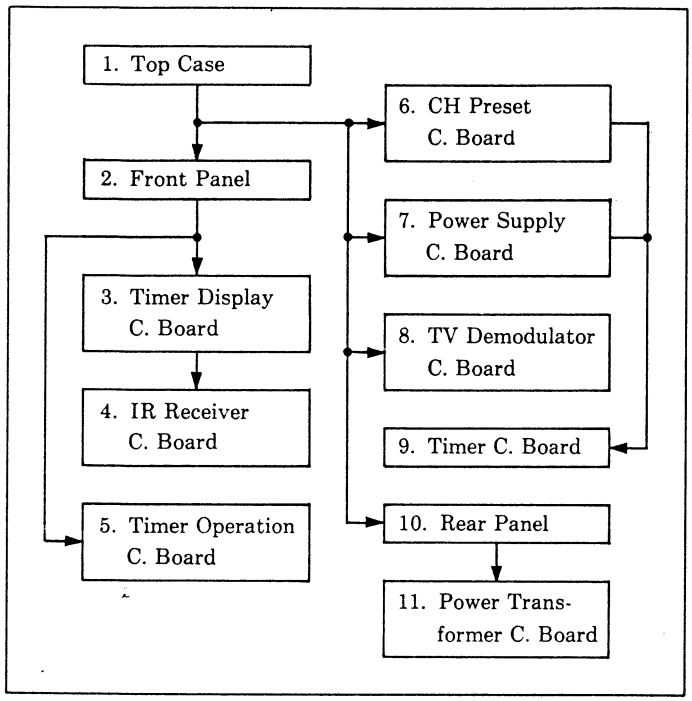

1. Top Case
2. Front Panel
3. Timer Display C. Board
4. IR Receiver C. Board
5. Timer Operation C. Board
6. CH Preset C. Board
7. Power Supply C. Board
8. TV Demodulator C. Board
9. Timer C. Board
10. Rear Panel
11. Power Transformer C. Board

Fig. 1 Disassembly Flow Chart

3-2. DETAILED DISASSEMBLY METHOD

1. Removal of the Top Case

Unscrew the 2 screws (A) and lift the tail portion of the Top Case to remove it.

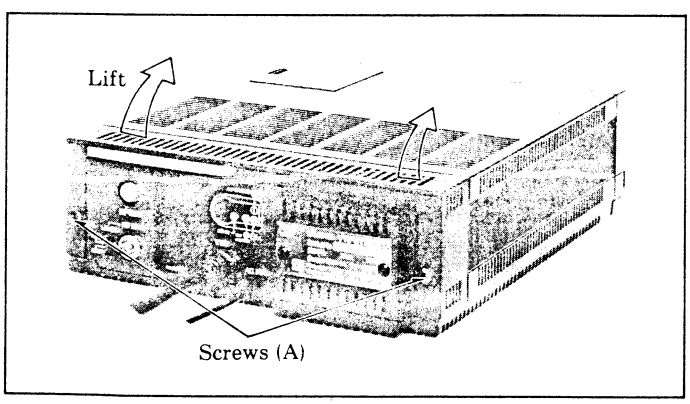


Fig. 2 Removal of the Top Case

Note:

When reinstalling, first insert the locking portions of the front edge of the Top Case to the Front Panel.

2. Removal of the Front Panel

1. Unlock the 2 locking tabs (B) and pivot the top portion of the Front Panel to remove it.

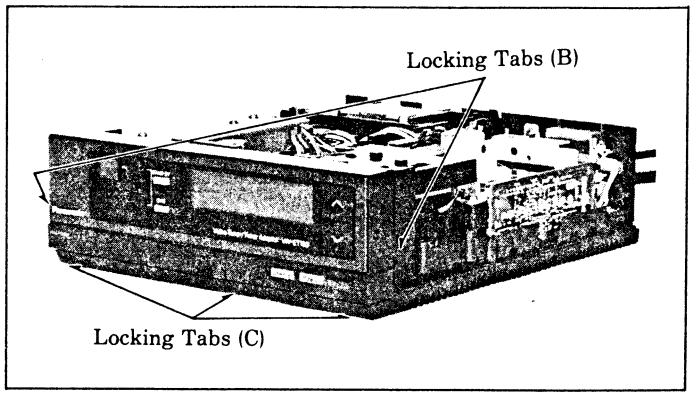


Fig. 3 Removal of the Front Panel

Note:

When installing, first set the locking tabs (C) to the projections of the bottom case.

3. Removal of the Timer Display C. Board

Unlock the 3 locking portions (D) and lift and pivot the top portion of the Timer Display C. Board and Remove it.

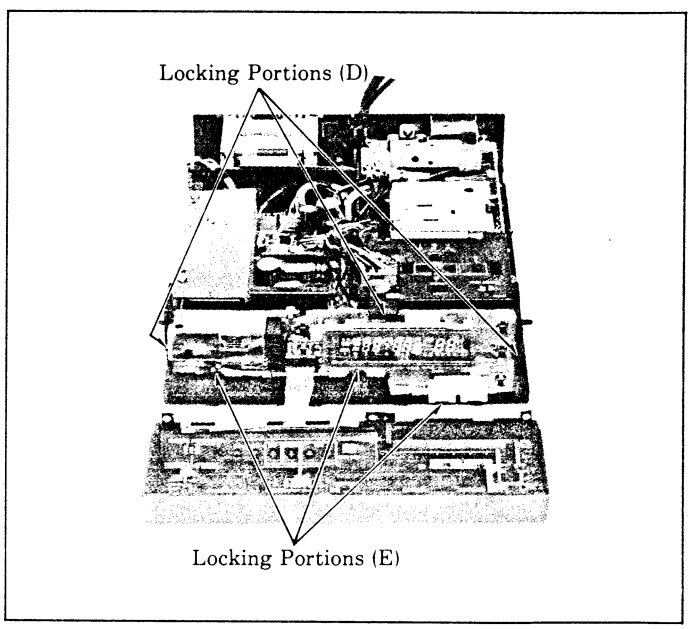


Fig. 4 Removal of the Timer Display C. Board

Note:

When reinstalling, first insert bottom of the Timer Display C. Board to the locking tabs (E).

4. Removal of the IR Receiver C. Board Shield Case

Remove the solder at 4 portions on the Timer Display C. Board and pull the shield case.

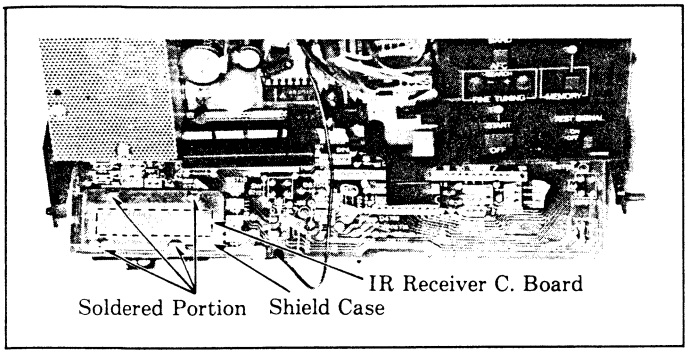


Fig. 5 Removal of the IR Receiver C. Board Shield Case

5. Removal of the Timer Operation C. Board

Unlock the 2 locking tabs (F) carefully, and widen the width between the Timer Operation C. Board and the Timer Operation Panel and pull out the Timer Operation C. Board.

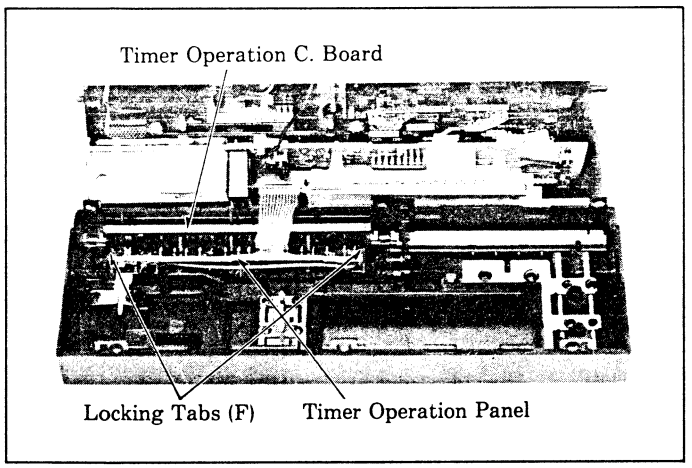


Fig. 6 Removal of the Timer Operation C. Board

6. Removal of the CH Preset C. Board

Unscrew 3 screws (G) and lift the CH Preset C. Board with CH preset bracket.

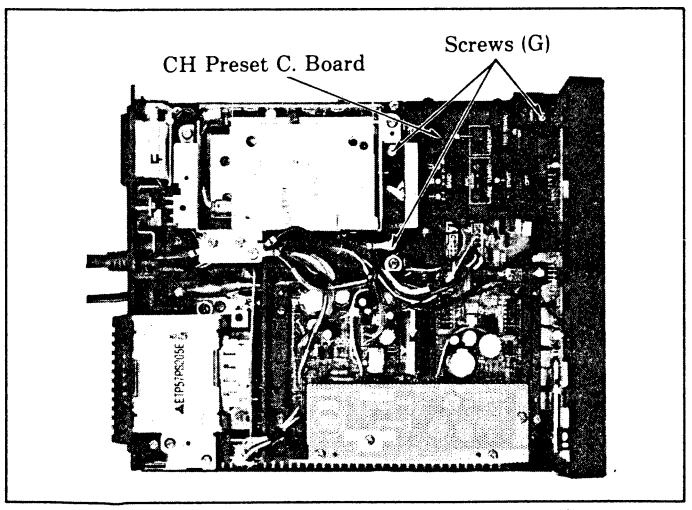


Fig. 7 Removal of the CH Preset C. Board-(1)

Next, unscrew the screw (H) and unlock the 5 locking tabs (I) to remove the CH preset C. Board from the preset VR case.

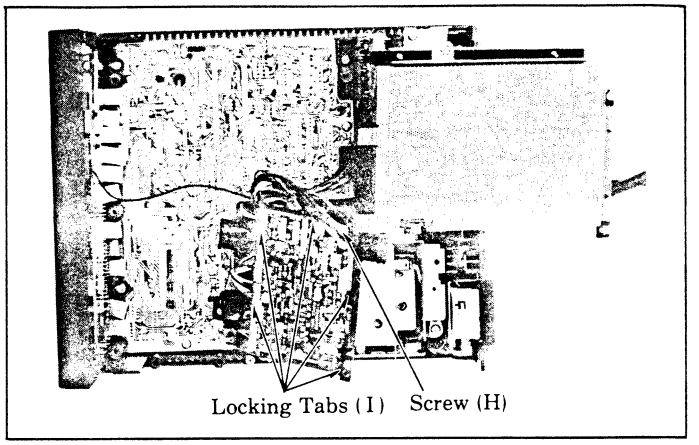


Fig. 8 Removal of the CH Preset C. Board-(2)

7. Removal of the Power Supply C. Board

Unscrew 4 screws (J) and lift the Power Supply C. Board.

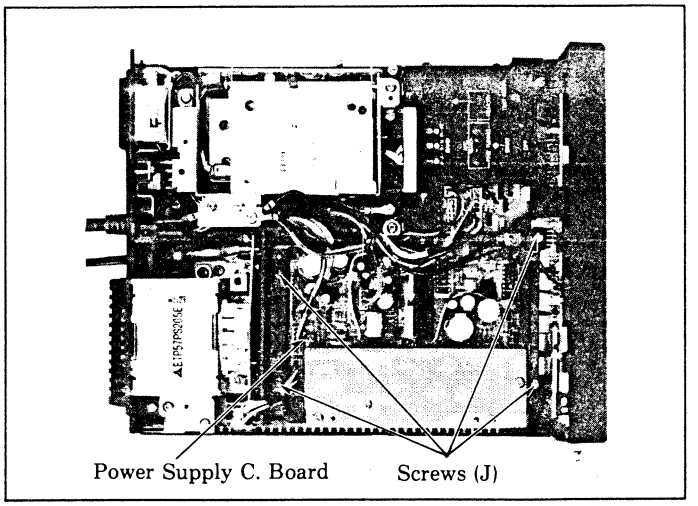


Fig. 9 Removal of the Power Supply C. Board

8. Removal of the Tuner C. Board and TV Demodulator C. Board

Unscrew the 3 screws (K) and lift the Tuner C. Board and TV Demodulator C. Board.

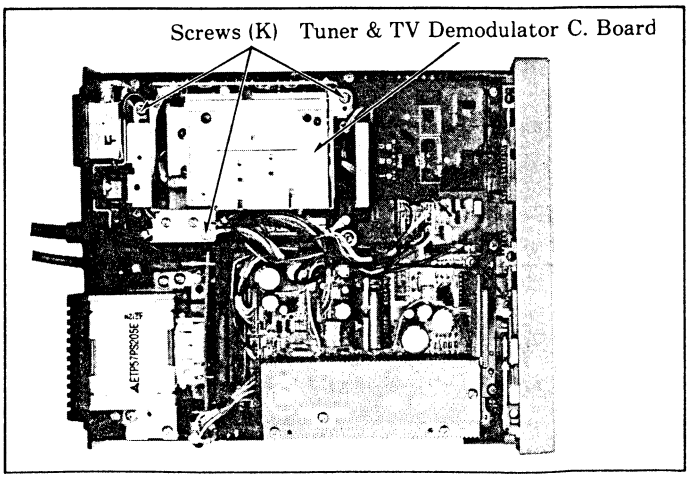


Fig. 10 Removal of the Tuner C. Board and TV Demodulator C. Board-(1)

Next, remove the solder at 4 portions on Tuner C. Board and TV Demodulator C. Board and turn on the both P.C. Boards.

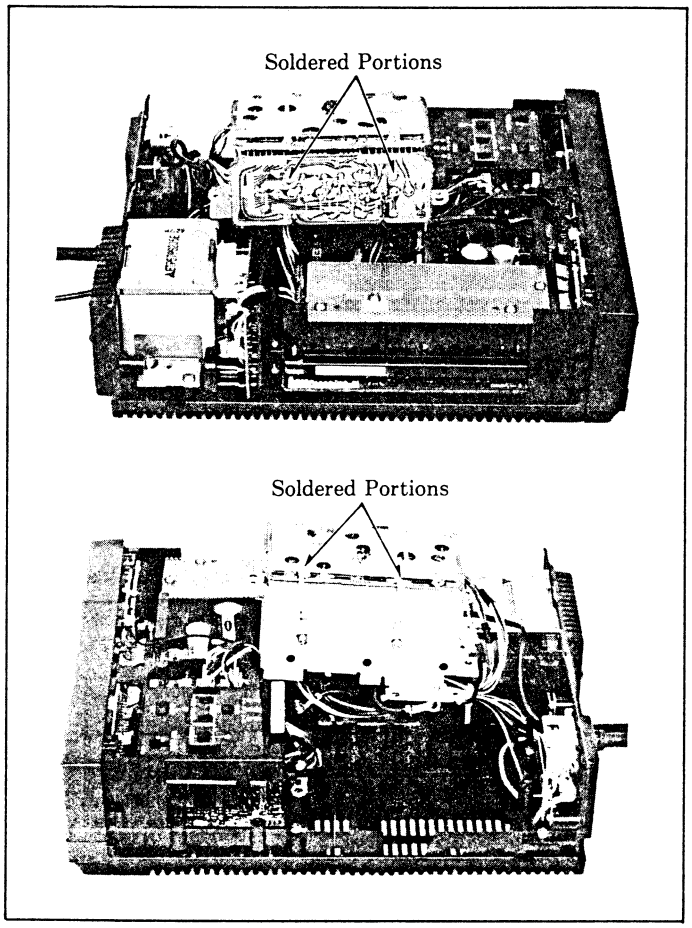


Fig. 11 Removal of the Tuner C. Board and the TV Demodulator C. Board-(2)

9. Removal of the Timer C. Board

Unscrew the 3 screws (L) and lift the Timer C. Board.

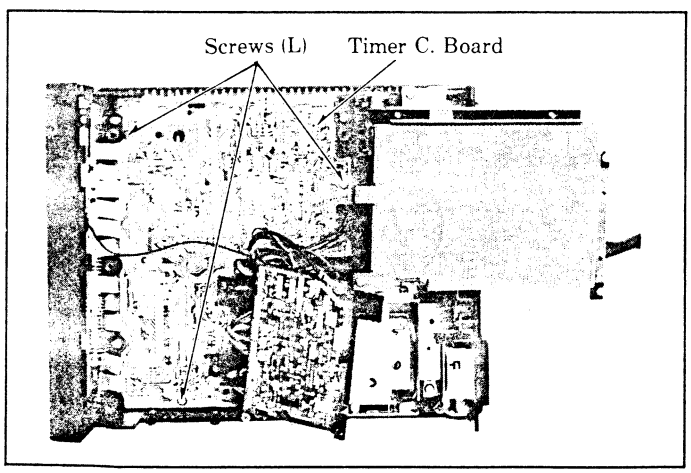


Fig. 12 Removal of the Timer C. Board

10. Removal of the Rear Panel

Unscrew 2 screws (M) and unlock the locking tab (N), then lift the Rear Panel.

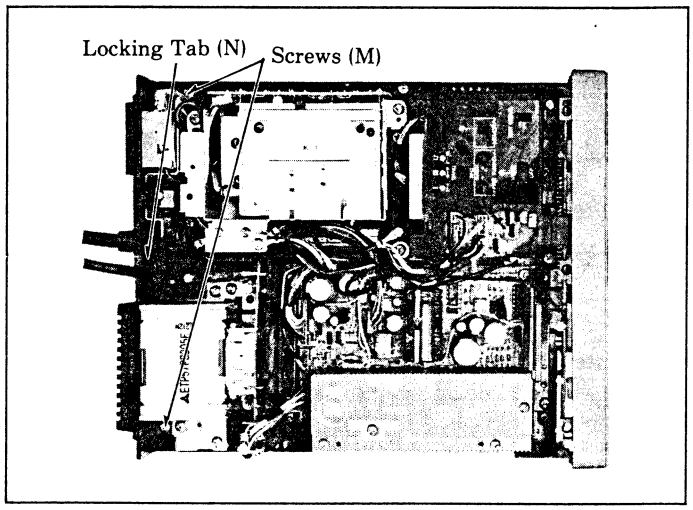


Fig. 13 Removal of the Rear Panel

11. Removal of the Power Transformer C. Board

Unscrew the 4 screws (O), and then lift the Power Transformer C. Board.

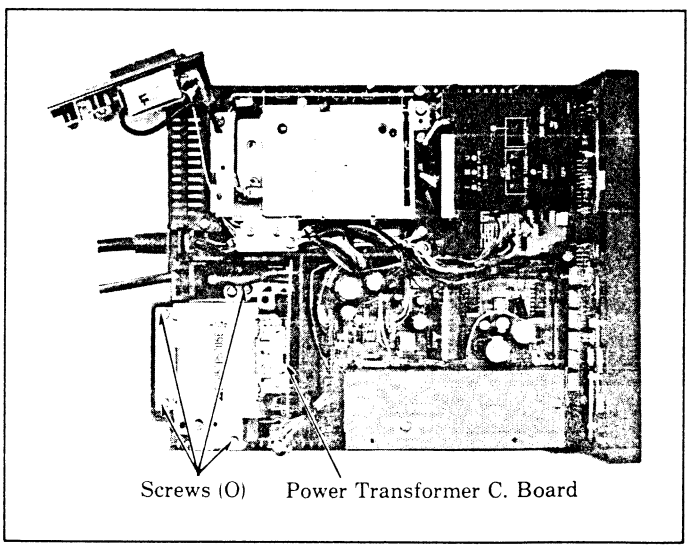


Fig. 14 Removal of the Power Transformer C. Board

4. REPLACEMENT OF AC CORD

Note:

When AC cord is replaced, please change both AC cord cover and Binding wire without fail for safety operation.

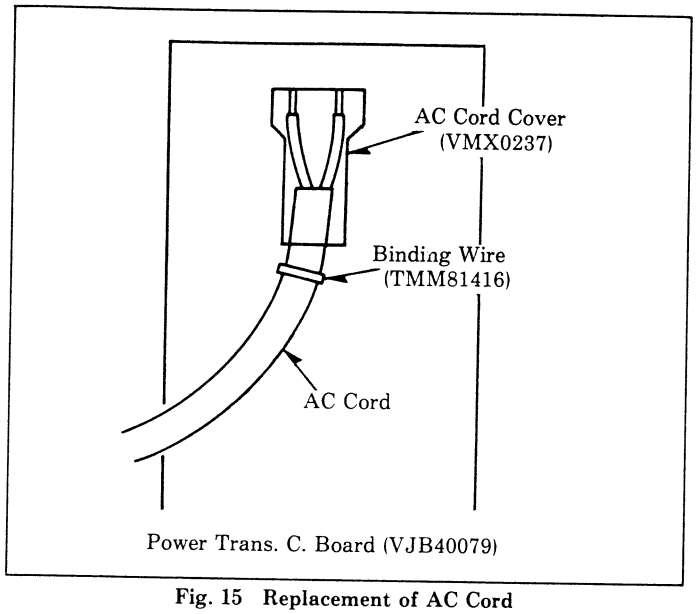


Fig. 15 Replacement of AC Cord

5. ELECTRICAL ADJUSTMENT PROCEDURES

POWER SUPPLY SECTION

5-1. TEST EQUIPMENTS

To make adjustment completely, following equipments are required.

1. D.V.M. (Digital Volt Meter)
2. Resistor (12.5Ω/20W)
3. Jumper Wire
4. Plastic Tip Driver
5. DC A.M. (DC Ammeter)
6. DC V.M. (DC Voltmeter)
7. Diode
8. Resistor (5Ω/100W)
9. DC Power Unit (0~30V, more than 5A)

5-2. 12.5V ADJUSTMENT

TP	ADJ.	MODE	INPUT
P104-2	R205		
TAPE	M. EQ.	SPEC.	
	D.V.M.	12.5 ± 0.1V DC	

1. Connect the resistor (12.5Ω/20W) between P104-(2) and the GND.
2. Set the power switch ON and connect a jumper wire between Q158-(C) and Q158-(E) for the Deck mode.

5-3. CHARGE VOLTAGE AND TRICKLE CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
P104-(2) (+) P104-(1) (−)	R172 R175		
TAPE	M. EQ.	SPEC.	
	DC A.M. DC V.M.	0.8 ± 0.05A (R172) 25 ± 5mA (R175)	

1. Set the charge current adjustment VR (R172) at center position and set the charge voltage adjustment VR (R175) fully counterclockwise.
2. Set the voltage of the DC POWER SUPPLY is as shown in Fig. 16.

TEMP. (°C)	OUTPUT VOLTAGE (V)
0	15.6
10	15.3
20	15.0
30	14.7
40	14.4

Fig. 16

3. Connect the DC POWER SUPPLY to P104-(1) and P104-(2) as shown in Fig. 17.

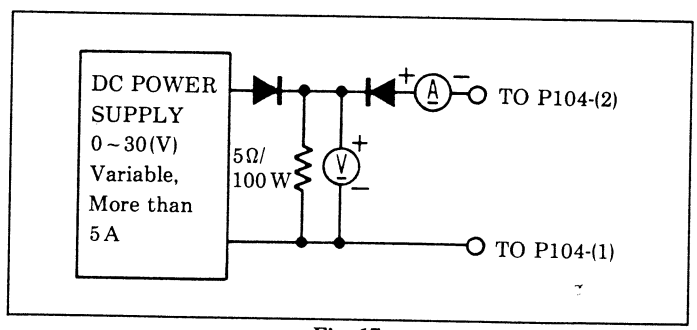


Fig. 17

4. Set the power switch ON.
5. Adjust R172 so that the charge current becomes 0.8 ± 0.05A. Then adjust R175 so that the charge current becomes 25 ± 5mA.

TV DEMODULATOR SECTION

Model No.: VW-ET180E/EO

5-4. TEST EQUIPMENTS

To make adjustments completely, following equipments are required.

1. VIF Sweep Generator with the Trap Adjustor 38.9MHz
2. SIF Sweep Generator .....5.5MHz ± 150kHz
3. CW Oscillator .....38.9MHz ± 100kHz
4. Digital Volt Meter
5. Oscilloscope
6. Monitor Scope

5-5. SELECTIVE COIL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP707	T703 T704		VIF SWEEP
TAPE	M. EQ.	SPEC.	
	VIF SWEEP MONITOR SCOPE	A=0.1 Vp-p B=38.9 MHz	

1. Set the BAND SW of the Unit to the VHF high position (VH) and turn the tuning volume so that the voltage at BT terminal of the tuner becomes 15 V.
2. Connect the VIF Sweep to TP703 and connect the Monitor Scope to TP707 as shown in Fig. 18.

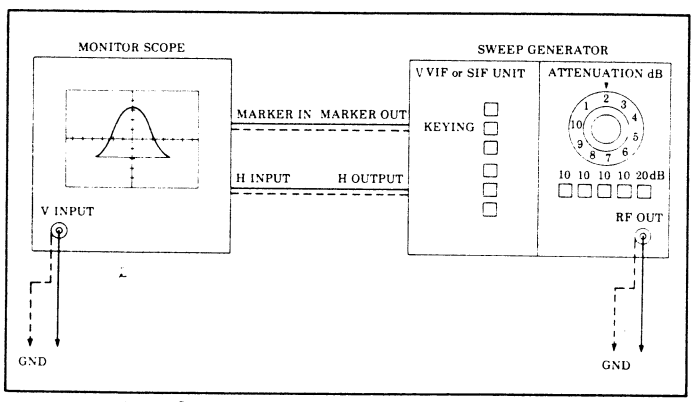


Fig. 18 Connection of Measuring Equipment

3. Connect the JIG to both points P703-(11) and TP709 as shown in Fig. 19 and adjust VR1 so that the noise of waveform on the monitor scope becomes minimum.

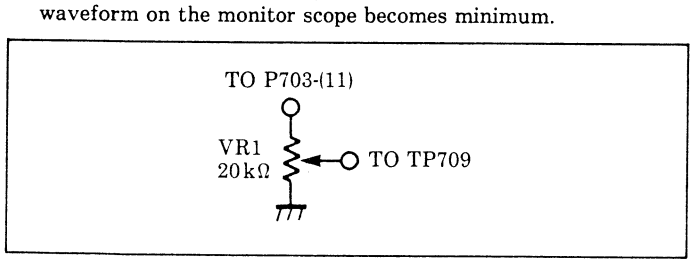


Fig. 19

4. Adjust the sweep output becomes 0.1 Vp-p.
5. Adjust T703 so that the marker position at 38.9 MHz becomes peak point.

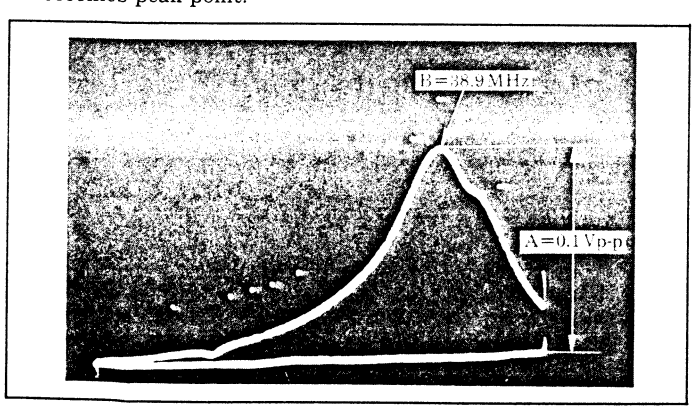


Fig. 20

6. Adjust T704 so that the marker portion at 38.9 MHz becomes as shown below.

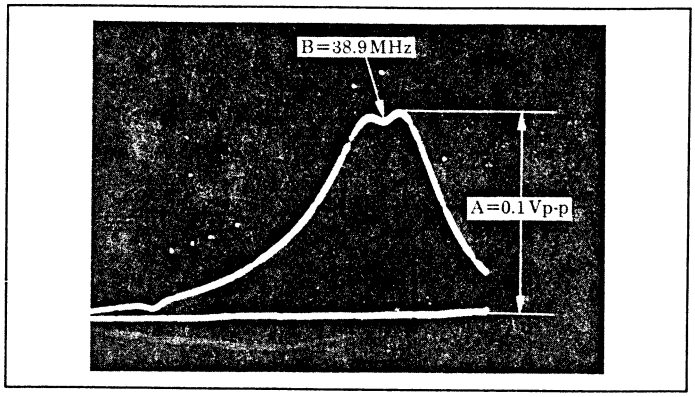


Fig. 21

5-6 VIF SWEEP ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP707	T701 T702		VIF SWEEP
TAPE	M. EQ.	SPEC.	
	VIF SWEEP MONITOR SCOPE		

1. Set the BAND SW to the VHF high position (VH) and turn the tuning volume so that the voltage at BT terminal of the tuner becomes 15 ± 0.5 V.
2. Connect the VIF Sweep to Test Point of the Tuner and connect the Monitor Scope to TP707 as shown in Fig. 18.
3. Connect a jumper between the AGC terminal of the Tuner Unit and the GND.
4. Connect the 100Ω resistor between TP704 and TP705.
5. Connect the JIG to both points P703-(11) and TP709 as shown in Fig. 19 and adjust VR1 so that the VIF waveform becomes maximum, and adjust the VIF sweep output so that the VIF waveform becomes 1.0 Vp-p.
6. Release 20 dB attenuation from the attenuator of the VIF Sweep.
7. Readjust VR1 of the JIG so that the VIF waveform becomes 1.0 Vp-p.
8. Adjust T702 so that the 33.4 MHz trap becomes minimum.
9. Adjust T701-(E) so that the 40.4 MHz trap becomes minimum.
10. Adjust T701-(C) so that the 31.9 MHz trap becomes minimum.
11. Adjust the Tuner converter coil and T701-(A), (B), (D), (F) so that the VIF waveform becomes as follows.

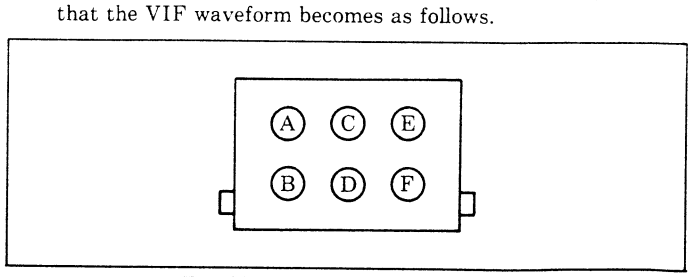


Fig. 22 HLB Transformer T701

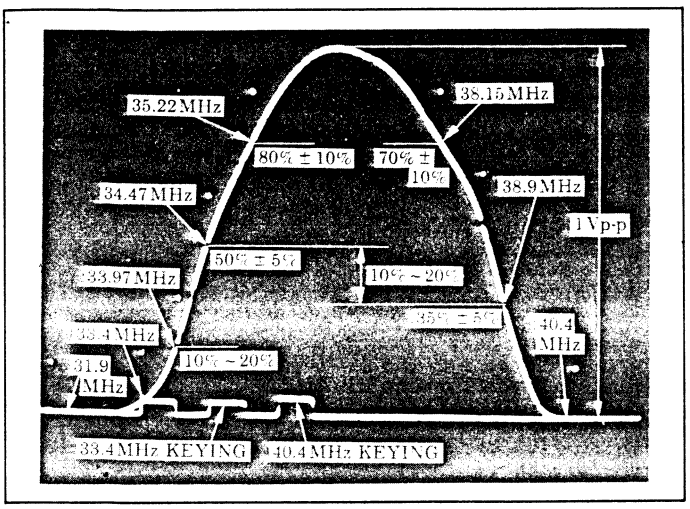


Fig. 23

6. Adjust T752 so that the 5.5MHz trap becomes minimum.
7. Release 20dB attenuation from the attenuator of the SIF Sweep, and confirm the waveform between the 5.5MHz −150kHz portion and 5.5MHz+150kHz portion is straight as follows.

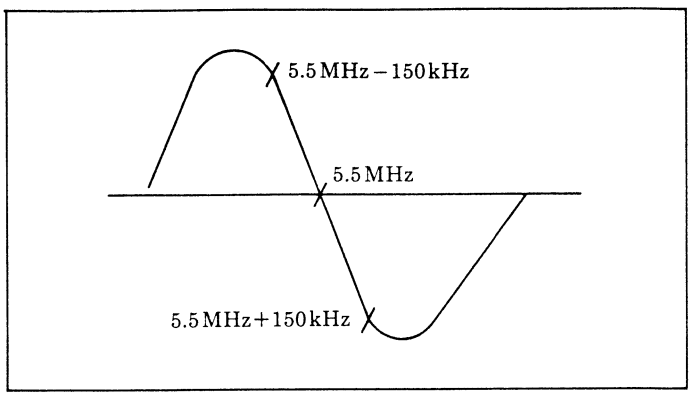


Fig. 25 SIF Waveform

5-7. SIF SWEEP ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP710	T751 T752		SIF SWEEP
TAPE	**M. EQ.**	**SPEC.**	
	SIF SWEEP D.V.M. MONITOR SCOPE		

1. Set the BAND SW to the VHF high position (VH) and turn the tuning volume so that the voltage at BT terminal of the tuner becomes 15V.
2. Adjust the SIF Sweep output to 6mVp-p (75Ω terminated).
3. Connect the SIF Sweep output to TP706 and connect the Monitor Scope to TP710.
4. Connect a jumper wire between TP709 and the GND.
5. Turn T752 clockwise so that the 5.5MHz portion of the waveform becomes maximum and adjust T751 so that the 5.5MHz portion of the waveform becomes maximum.

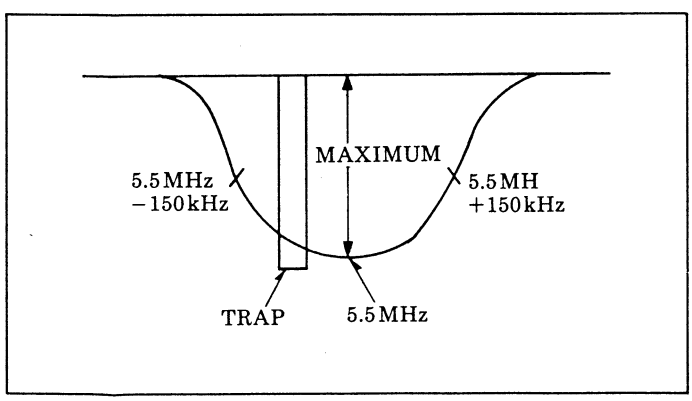


Fig. 24

5-8. AFT ADJUSTMENT

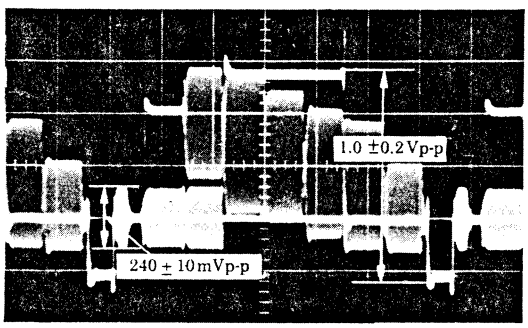
TP	ADJ.	MODE	INPUT
TUNER TP TP702	T704		CW OSC
TAPE	**M. EQ.**	**SPEC.**	
	CW OSCI- LLATOR D.V.M.	A ± 0.3V	

1. Set the BAND SW to the VHF high position (VH) and turn the tuning volume so that the voltage at BT terminal of the tuner becomes 15V ± 0.5V.
2. Set the CW oscillator so that the 38.9MHz CW signal becomes 1Vp-p.
3. Supply this signal to the Tuner Test Point.
4. Connect the Digital Voltmeter to the Tuner AFT terminal P702-(2).
5. Confirm the reading of the D.V.M., "A" is between 6.4V and 6.8V, when the AFT switch is off.
6. Set the AFT switch is "ON".
7. Adjust T704 so that the level at the Tuner AFT terminal P702-(2) becomes "A ± 0.3V".
8. Change the frequency of the CW oscillator ± 100kHz, centered at 38.9MHz and confirm that the difference of the AFT voltage is more than ± 3V.

5-9. BURST LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP711	R728		RF COLOUR BAR SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
	OSCILLO- SCOPE	240mVp-p	

1. Connect the 75Ω terminater between TP711 and the GND and connect the oscilloscope to TP711.
2. Tune in the VHF RF Colour Bar Signal.
3. Adjust R728 so that the burst level becomes 240mV± 10mVp-p.



0.2V/10μsec. div.

Fig. 26

TV DEMODULATOR SECTION

Model No.: VW-ET180B

5-10. TEST EQUIPMENTS

To make adjustments completely, following equipments are required.

1. VIF Sweep Generator with the Trap Adjustor 6.0MHz
2. SIF Sweep Generator .....6.0MHz± 150kHz
3. CW Oscillator .....39.5MHz± 100kHz
4. Digital Volt Meter
5. Oscilloscope
6. Monitor Scope

5-11. SELECTIVE COIL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP707	T703 T704		VIF SWEEP
TAPE	M. EQ.	SPEC.	
	VIF SWEEP/ MONITOR SCOPE	A=0.1Vp-p B=39.5MHz	

1. Set the channel to near 32CH.
2. Connect the VIF Sweep to TP703 and connect the Monitor Scope to TP707 as shown in Fig. 27.

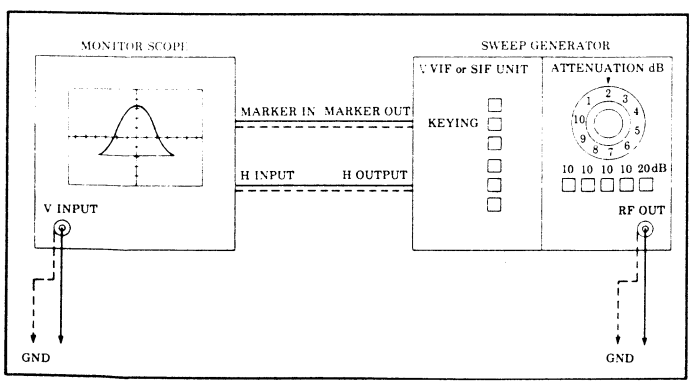


Fig. 27 Connection of Measuring Equipment

3. Connect the JIG to both points P703-(11) and TP709 as shown in Fig. 28 and adjust VR1 so that the noise of waveform on the monitor scope becomes minimum.

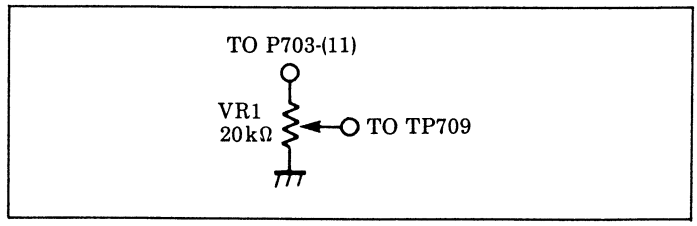


Fig. 28

4. Adjust the sweep output becomes 0.1Vp-p.
5. Adjust T703 so that the marker position at 39.5MHz becomes peak point.

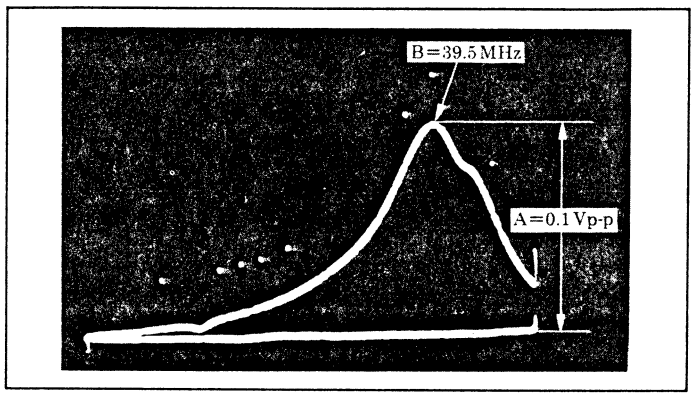


Fig. 29

6. Adjust T704 so that the marker portion at 39.5MHz becomes as shown below.

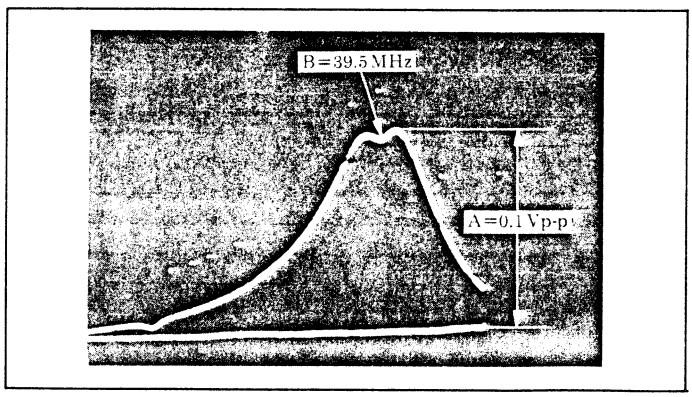


Fig. 30

5-12 VIF SWEEP ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP707	T701 T702		VIF SWEEP
TAPE	M. EQ.	SPEC.	
	VIF SWEEP/ MONITOR SCOPE		

1. Set the channel to near 32CH.
2. Connect the VIF Sweep to Test Point of the Tuner and connect the Monitor Scope to TP707 as shown in Fig. 27.
3. Connect a jumper between the AGC terminal of the Tuner Unit and the GND.
4. Connect the 100Ω resistor between TP704 and TP705.
5. Connect the JIG to both points P703-(11) and TP709 as shown in Fig. 27 and adjust VR1 so that the VIF waveform becomes maximum, and adjust the VIF sweep output so that the VIF waveform becomes 1.0Vp-p.
6. Release 20dB attenuation from the attenuator of the VIF Sweep.
7. Readjust VR1 of the JIG so that the VIF waveform becomes 1.0Vp-p.
8. Adjust T702 so that the 33.5MHz trap becomes minimum.
9. Adjust T701-(E) so that the 41.5MHz trap becomes minimum.
10. Adjust T701-(C) so that the 31.5MHz trap becomes minimum.
11. Adjust the Tuner converter coil and T701-(A), (B), (D), (F) so that the VIF waveform becomes as follows.

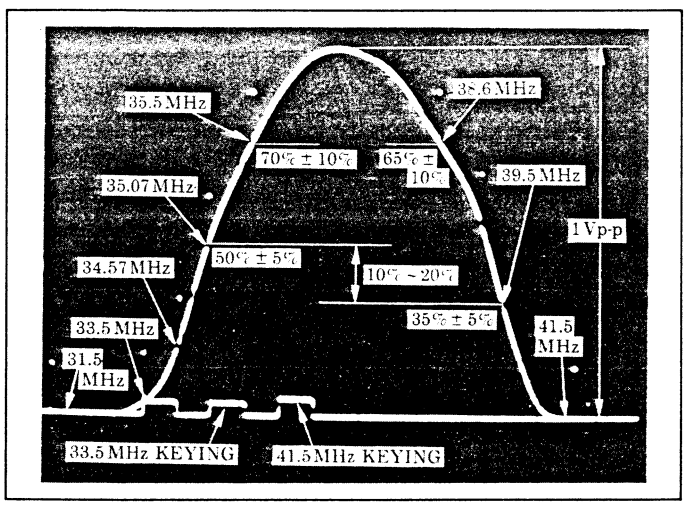


Fig. 31

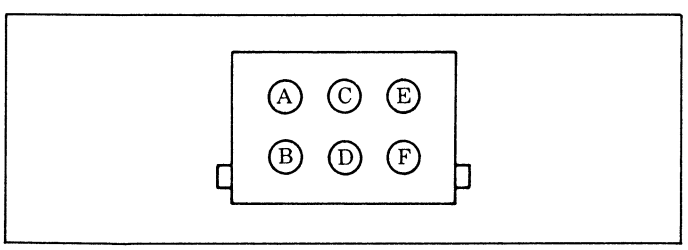


Fig. 32 HLB Transformer T701

5-13. SIF SWEEP ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP710	T751 T752		SIF SWEEP
TAPE	M. EQ.	SPEC.	
	SIF SWEEP/ D.V.M./ MONITOR SCOPE		

1. Set the channel to near 32CH.
2. Adjust the SIF Sweep output to 6mVp-p (75Ω terminated).
3. Connect the SIF Sweep output to TP706 and connect the Monitor input to TP710.
4. Connect a jumper wire between TP709 and the GND. Turn T752 clockwise so that the 6.0MHz portion of the waveform becomes maximum and adjust T751 so that the 6.0MHz portion of the waveform becomes maximum.

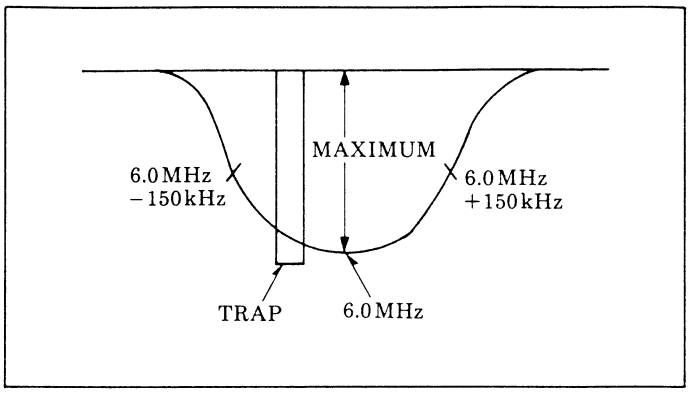


Fig. 33

5. Adjust T752 so that the 6.0MHz trap becomes minimum.
6. Release 20dB attenuation from the attenuator of the SIF Sweep and confirm the waveform between the 6.0MHz −150kHz portion and 6.0MHz+150kHz portion is straight as follows.

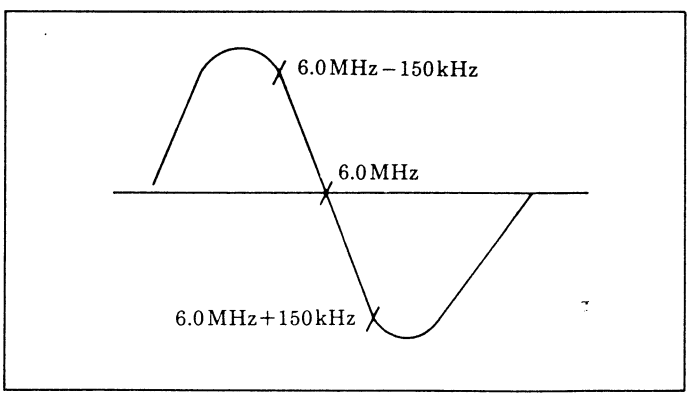


Fig. 34 SIF Waveform

5-14. AFT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TUNER TP TP702	T704		CW OSC
TAPE	M. EQ.	SPEC.	
	CW OSCI- LLATOR/ D.V.M.	A± 0.3V	

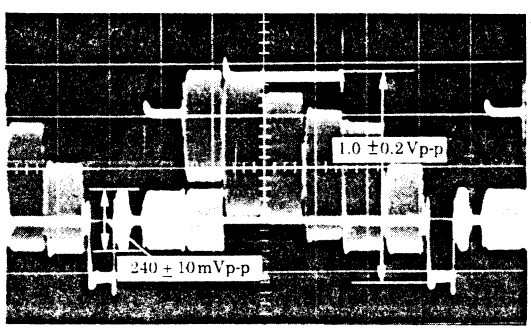
1. Set the channel to 52CH.
2. Set the CW oscillator so that the 39.5MHz CW signal becomes 1Vp-p.
3. Supply this signal to the Tuner Test Point.
4. Connect the Digital Voltmeter to the Tuner AFT terminal P702-(2).

5. Confirm the reading of the D.V.M., "A" is between 6.4 V and 6.8 V, when the AFT switch is off.
6. Adjust T704 so that the level at the Tuner AFT terminal P702-(2) becomes "A ± 0.3 V".
7. Change the frequency of the CW oscillator ± 100 kHz, centered at 39.5 MHz and confirm that the difference of the AFT voltage is more than ± 3 V.

5-15. BURST LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP711	R728		RF COLOUR BAR SIGNAL
TAPE	M. EQ.	SPEC.	
	OSCILLO-SCOPE	240 mVp-p	

1. Connect the 75Ω terminater between TP711 and the GND, and connect the oscilloscope to TP711.
2. Tune in the UHF RF Colour Bar Signal.
3. Adjust R728 so that the burst level becomes 240 mV ± 10 mVp-p.



0.2 V/10 μsec. div.

Fig. 35

TIMER SECTION

5-16. TEST EQUIPMENTS

To make adjustment completely, following equipments are required.

1. Frequency Counter
   Frequency Range: 0 ~ 10 MHz
2. DC Power Supply
3. D.V.M.
   Input Impedance: more than 1 MΩ
3. Plastic Tip Driver

5-17. TIMER CLOCK ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC6721-(37)	C6723		
TAPE	M. EQ.	SPEC.	
	FREQUEN-CY COUNTER	7812.5 ± 0.012 μsec.	

5-18. TIMER RESET VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
Q6725-(C)	R6733		
TAPE	M. EQ.	SPEC.	
	D.V.M./DC POWER SUPPLY		

1. Disconnect the AC plug of the deck and disconnect the connector P6702.
2. Set the voltage of the DC POWER SUPPLY for 4.0 ± 0.05 V, then connect the DC POWER SUPPLY to cathode of D6746.
3. Adjust R6733 so that the indication of the D.V.M. changes from low to high.

5-19. SERIAL DECODER RESET ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC7001-(12)	R7007		
TAPE	M. EQ.	SPEC.	
	D.V.M./DC POWER SUPPLY		

1. Disconnect the AC plug of the deck and disconnect the connector P6702.
2. Set the volage of the DC POWER SUPPLY for 4.5 ± 0.05 V, then connect the DC POWER SUPPLY to IC7001-(8).
3. Adjust R7007 so that the indication of the D.V.M. changes from low to high.

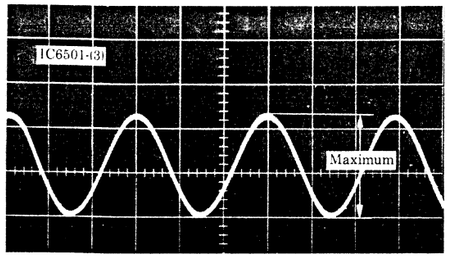
5-20. SYNC SEPARATION FREE RUN ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC6801-(4)	R6803		
TAPE	M. EQ.	SPEC.	
	FREQUEN-CY COUNTER	15.625 kHz ± 50 Hz	

5-21. INFRARED TUNING FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC6501-(3)	T6501		
TAPE	M. EQ.	SPEC.	
	OSCILLO-SCOPE SIGNAL GENERA-TOR (SINE WAVE)		

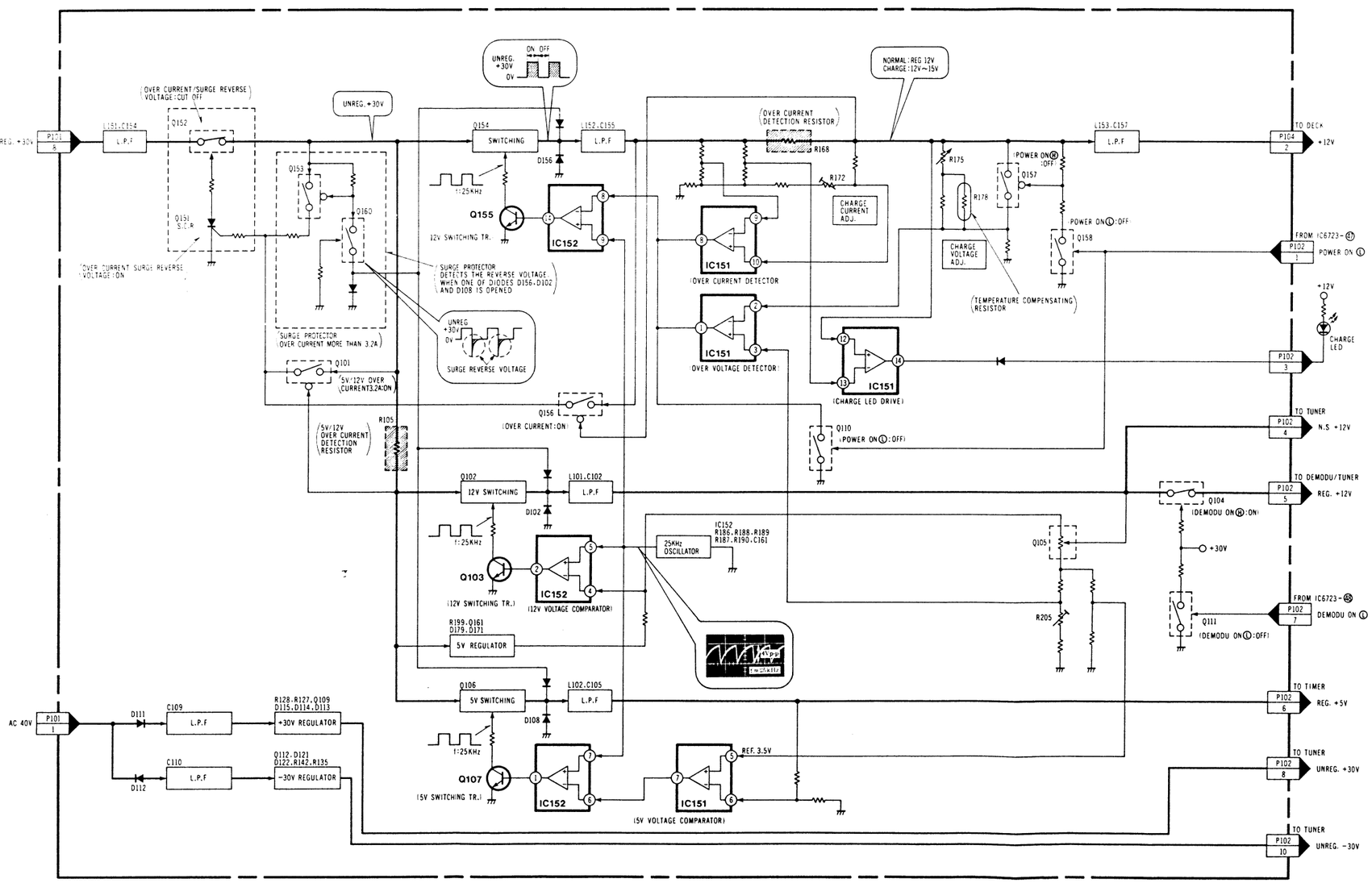
1. Set the SIGNAL GENERATOR for 35kHz ± 50Hz, then connect the SIGNAL GENERATOR to IC6501-(7), and connect the scope to IC6501-(3) .
2. Adjust the output level of the signal generator so that the waveform on the scope becomes sine wave.
3. Adjust T6501 so that the waveform becomes maximum.



0.5V/20μsec. div.

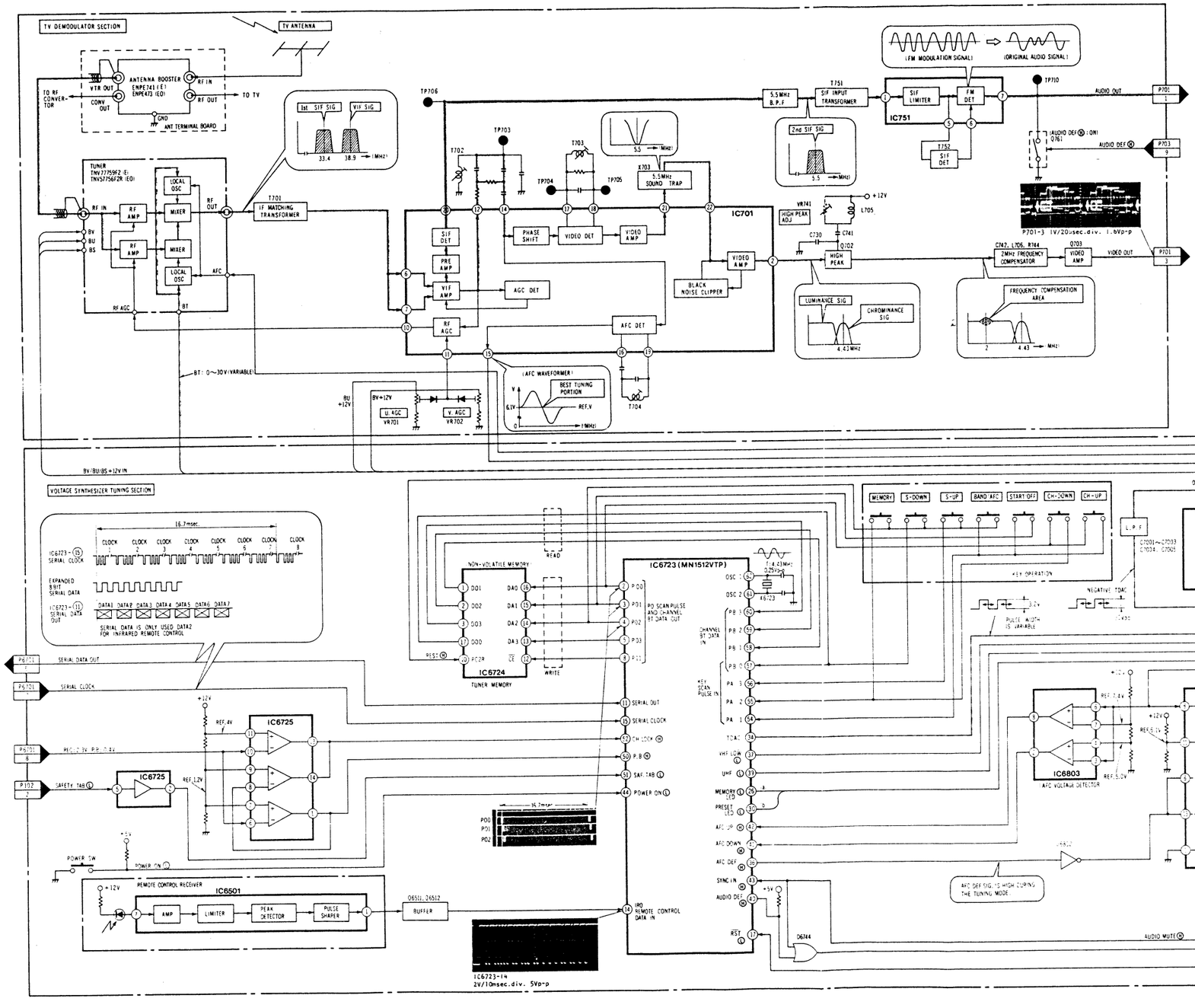
Fig. 36

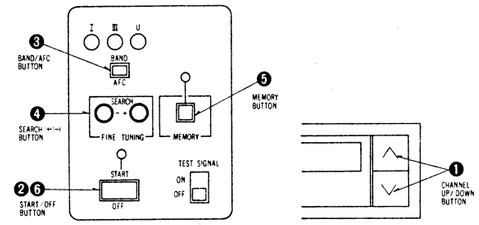
6. POWER SUPPLY BLOCK DIAGRAM



— 11 —

7. TUNER & TV DEMODULATOR BLOCK DIAGRAM (VW-ET180E/EO)





■ CH SELECT & TUNING PROCEDURE

1. Select the channel.
2. Press the START/OFF Button, so the START LED light up.
3. Set the BAND/AFC Button to the "I", "II", "U" position.
4. Press the SEARCH Button to search the TV station automatically. (The START LED will flash on and off during search.)
5. Press the MEMORY Button, so the MEMORY LED light up a moment.
6. Press the START/OFF Button to OFF.

VIDEO LOOP
AUDIO LOOP
BT (CHANNEL) DATA TRANSMISSION LOOP

Back Page: POWER SUPPLY Section

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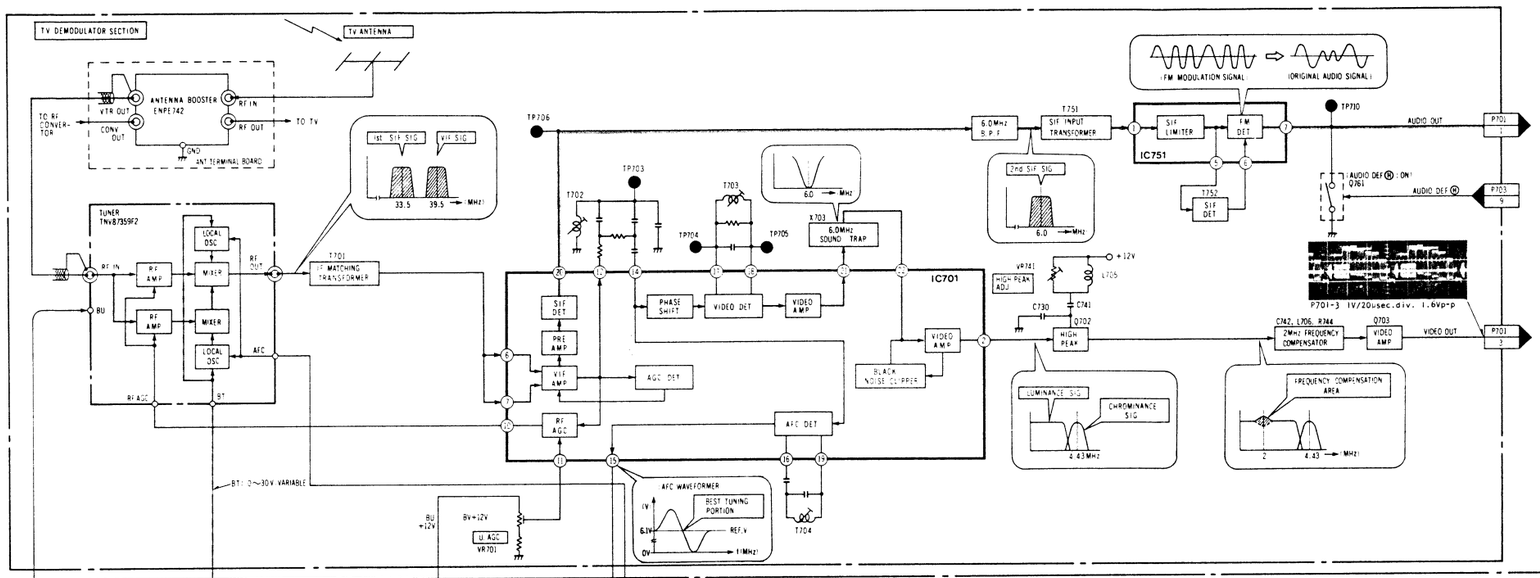
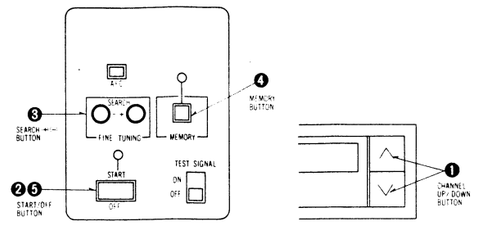
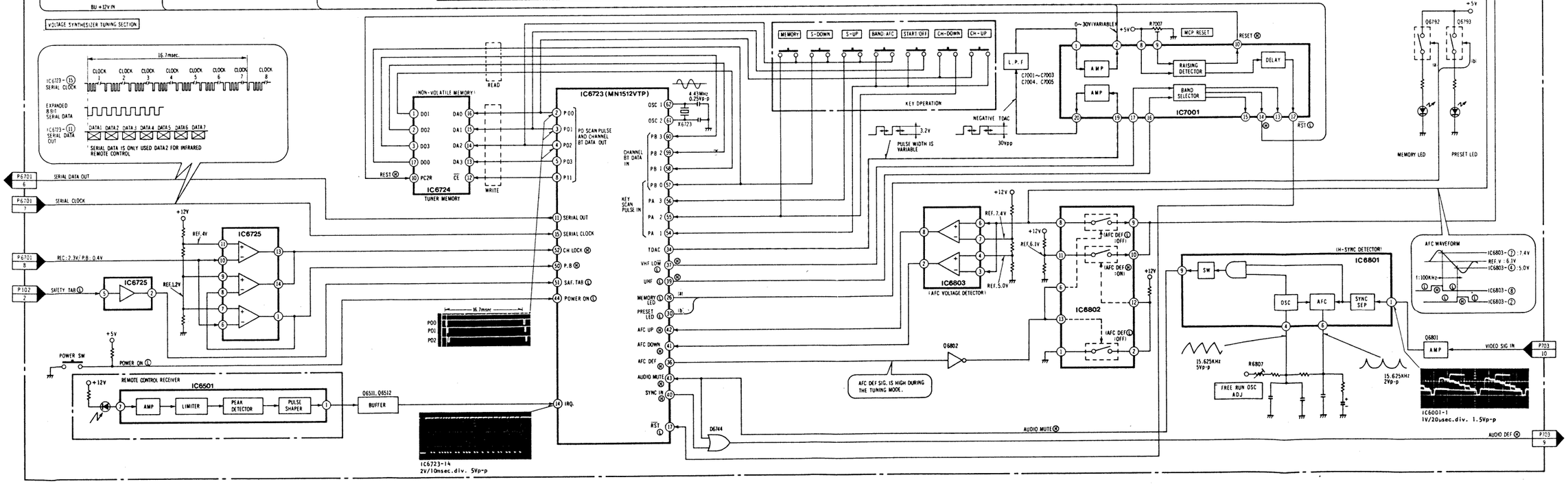
8. TUNER & TV DEMODULATOR BLOCK DIAGRAM (VW-ET180B)





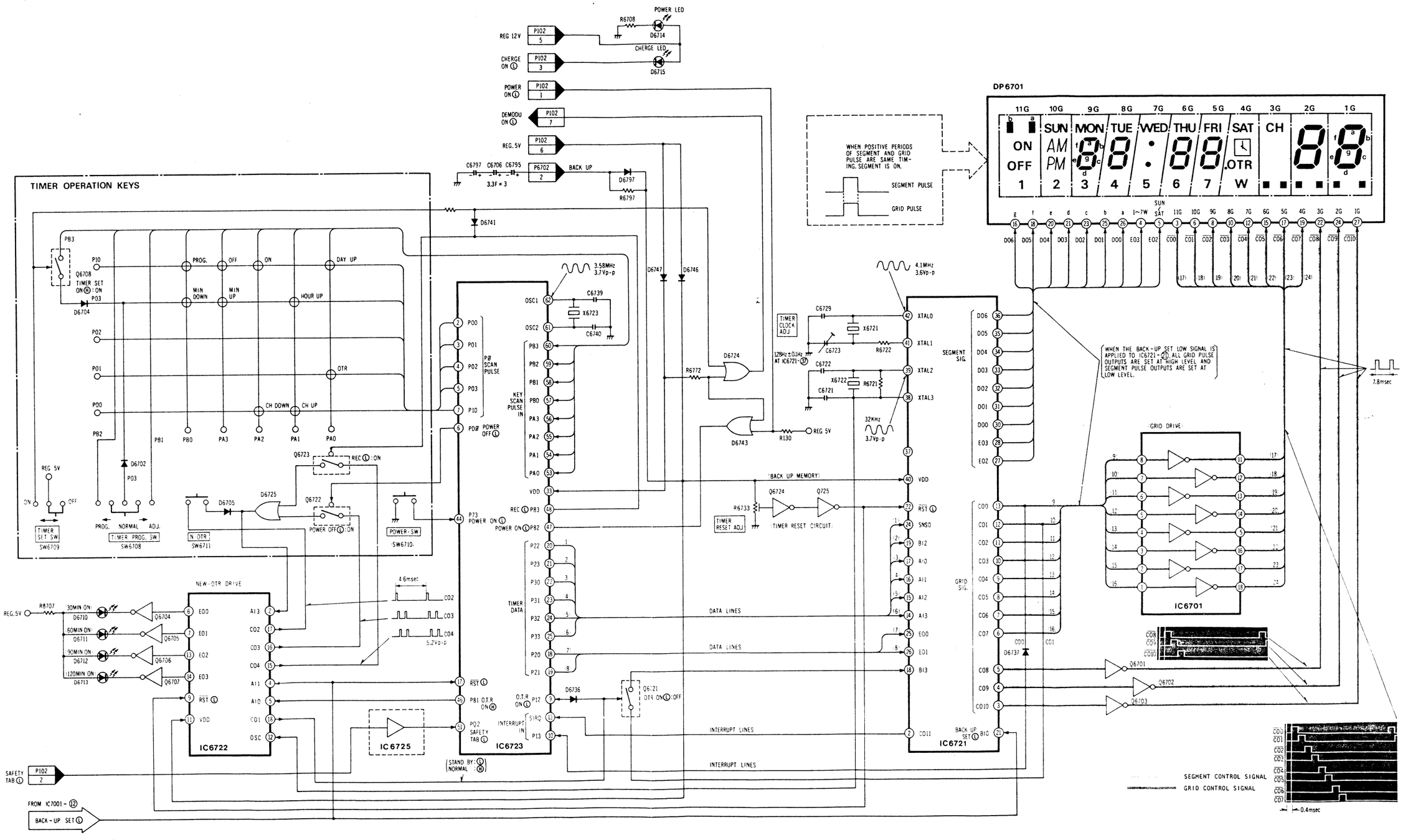
1. Select the channel.
2. Press the START/OFF Button, so the LED lights up.
3. Press the SEARCH Button to search the TV station automatically. (The START LED will flash on and off during search.)
4. Press the MEMORY Button, so the MEMORY LED light up a moment.
5. Press the START/OFF Button to off.

VIDEO LOOP
AUDIO LOOP
BT (CHANNEL) DATA TRANSMISSION LOOP



— 13 —

9. TIMER BLOCK DIAGRAM



Back Page:
TUNER & TV DEMODULATOR Section

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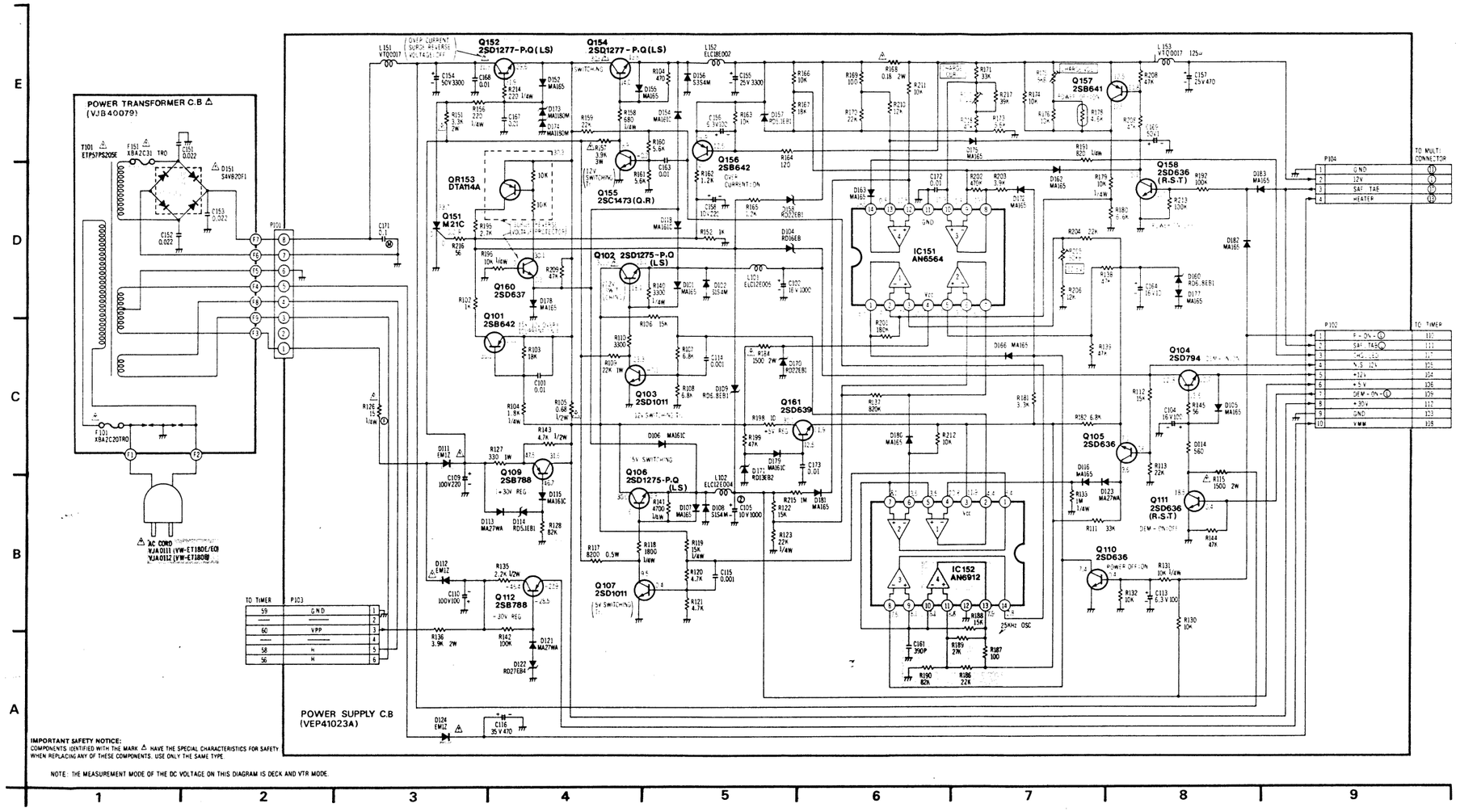
10. POWER SUPPLY SCHEMATIC DIAGRAM



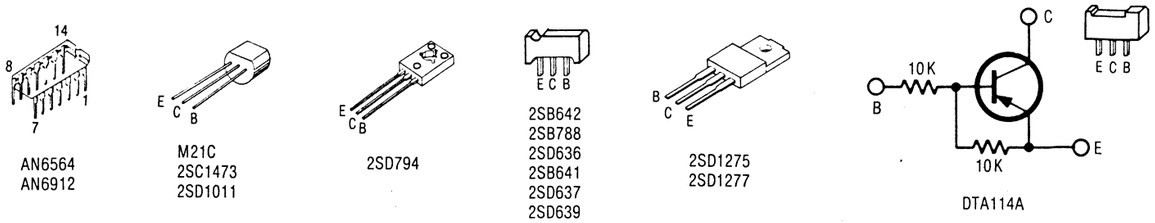
POWER SUPPLY SCHEMATIC	
Transistor	
Q101	C-4
Q102	D-4
Q103	C-5
Q104	C-8
Q105	C-8
Q106	B-5
Q107	B-5
Q109	B-4
Q110	B-8
Q111	B-8
Q112	B-4
Q151	D-3
Q152	E-4
Q154	E-4
Q155	E-4
Q156	E-5
Q157	E-8
Q158	D-8
Q160	D-4
Q161	C-6
Transistor & Resistor	
QR153	D-4
Integrated Circuit	
IC151	D-6
IC152	B-7
Adjustment	
R172	E-7
R175	E-7
R205	D-7
Connector	
P102	C-9
P103	B-2
P104	D-9

ADDRESS INFORMATION

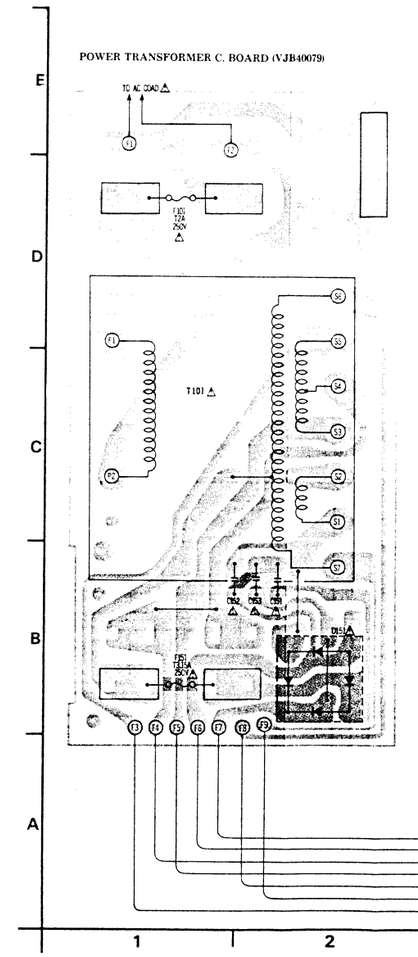
POWER SUPPLY CIRCUIT BOARD	
Transistor	
Q101	D-4
Q102	E-4
Q103	E-4
Q104	B-6
Q105	D-6
Q106	E-4
Q107	E-5
Q109	B-5
Q110	B-6
Q111	A-5
Q112	B-5
Q151	B-4
Q152	B-4
Q154	C-4
Q155	C-4
Q156	B-4
Q157	C-6
Q158	C-6
Q160	C-4
Q161	E-5
Transistor & Resistor	
QR153	C-4
Integrated Circuit	
IC151	D-6
IC152	E-6
Adjustment	
R172	C-6
R175	C-6
R205	D-6

ADDRESS INFORMATION

ICs & TRANSISTORs INFORMATION

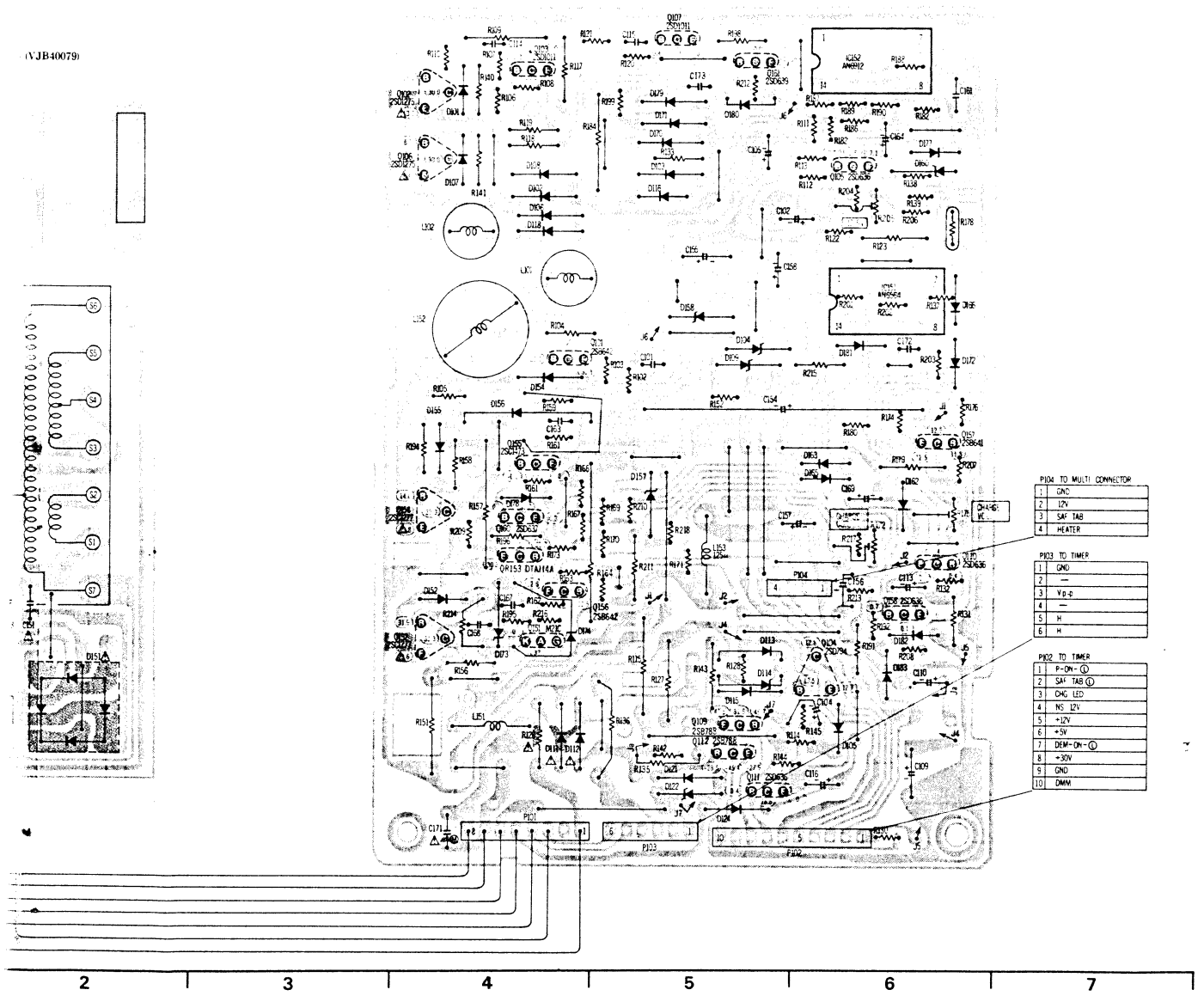


11. POWER TRANSFORM (VEP41023A) CIRCUIT



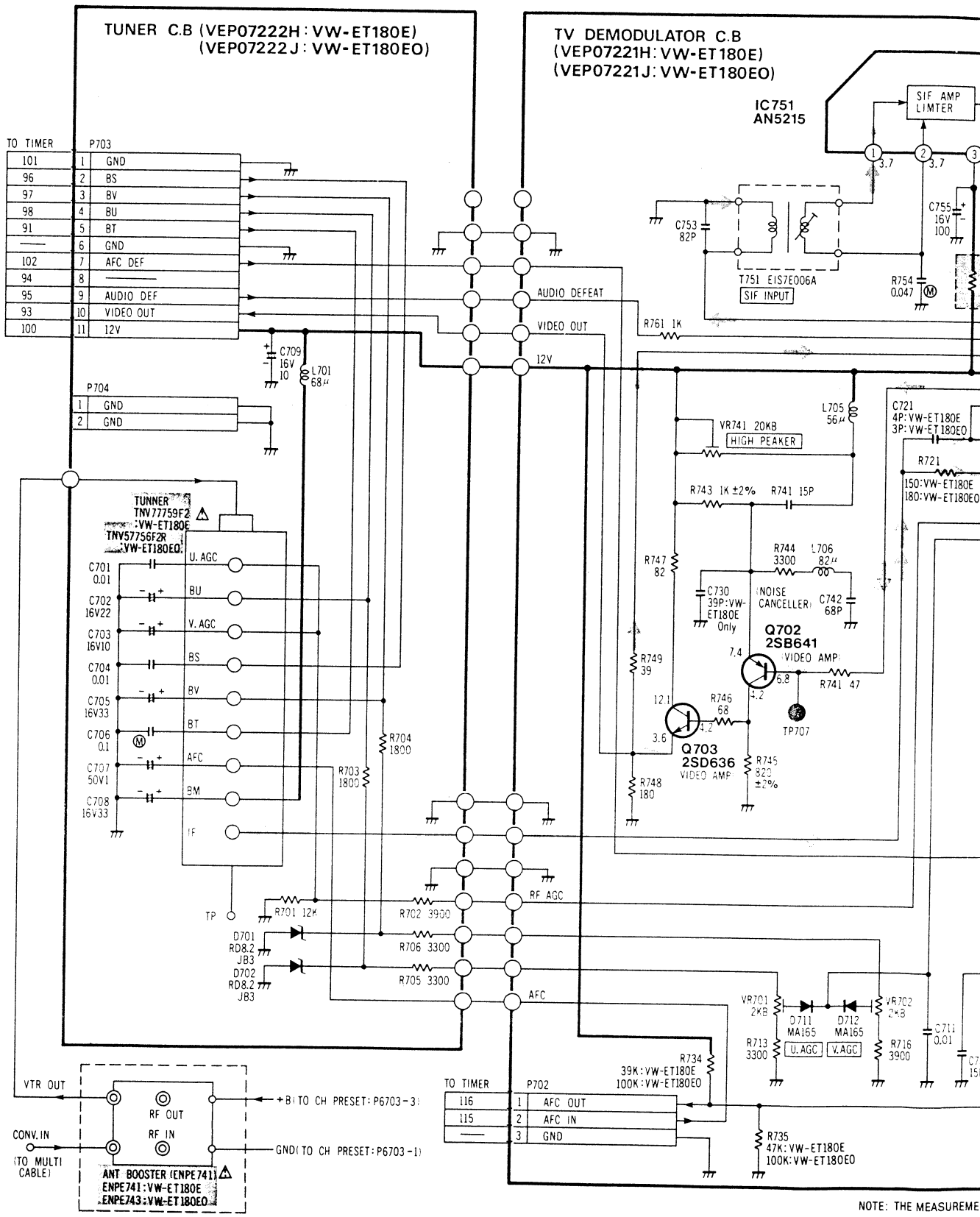
ANSFORMER (VJB40079) & POWER SUPPLY CIRCUIT BOARDS

POWER SUPPLY C. BOARD (VEP41023A)



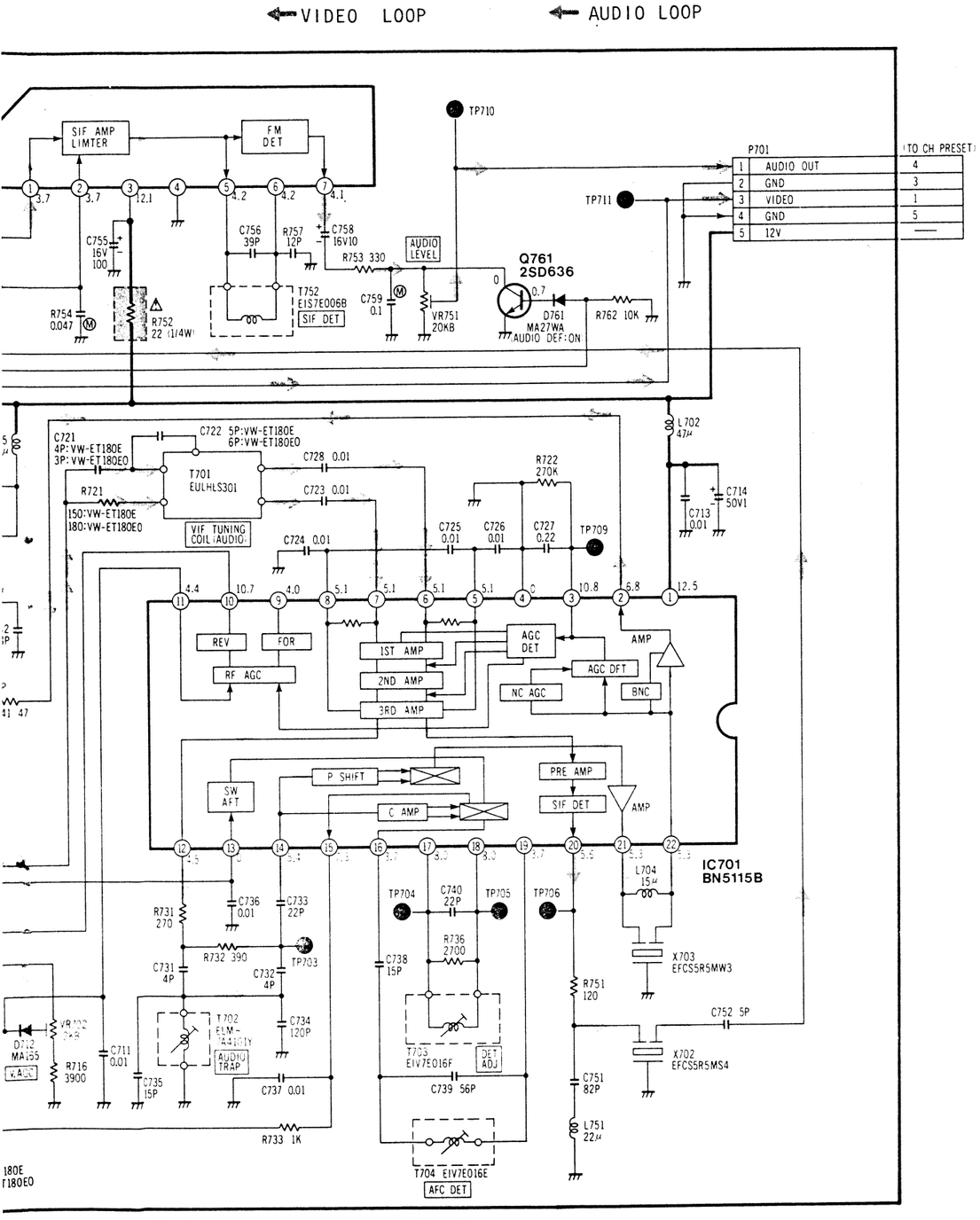
Next Page:
TV DEMODULATOR Section

12. TV DEMODULATOR SCHEMATIC DIAGRAM (VW-ET180E/EO)



NOTE: THE MEASUREME

E/EO)



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

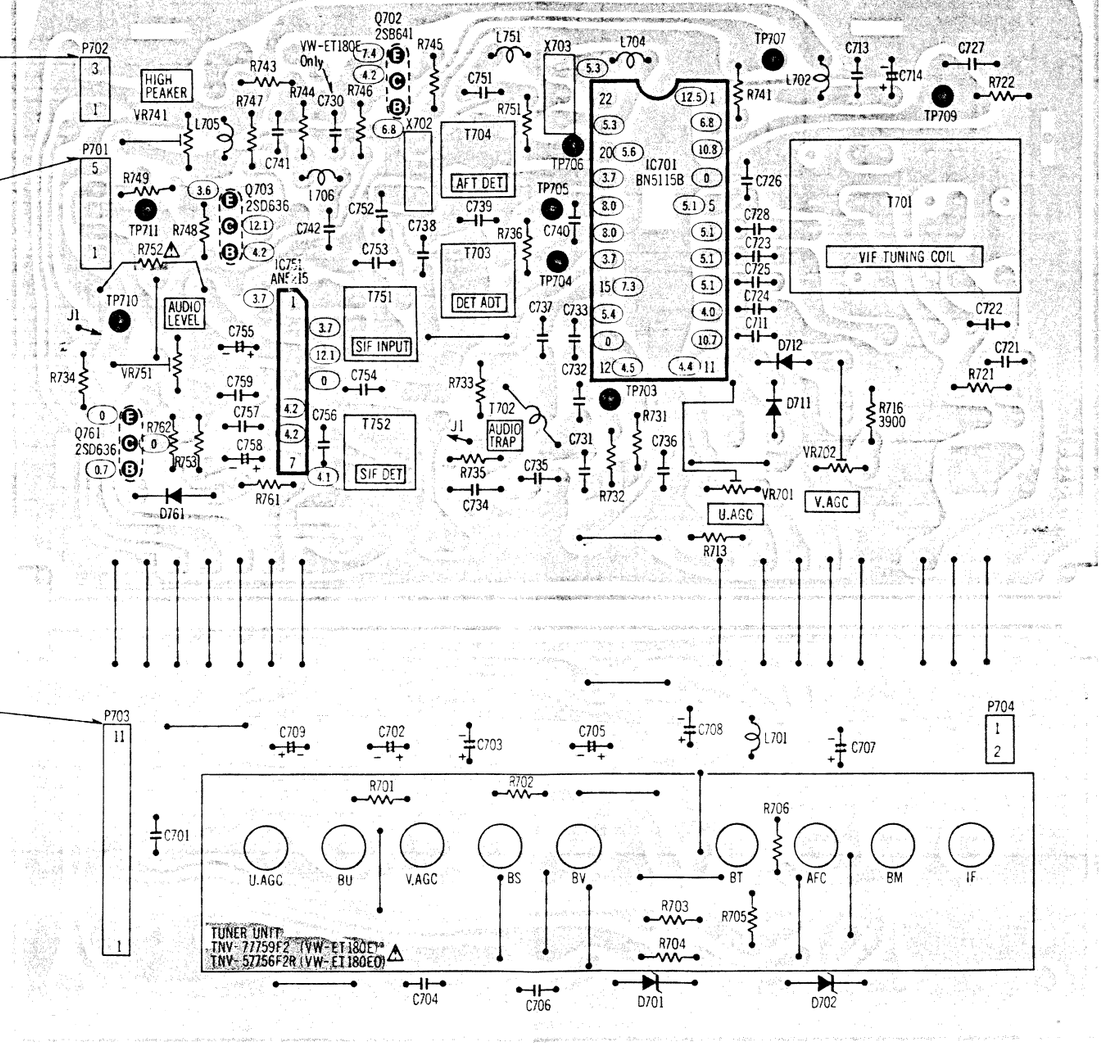
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK △ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

13. TV DEMODULATOR (VEP07221H: VW-ET180E/VEP07221J: VW-ET180EO) & TUNER (VEP07222H: VW-ET180E/VEP07222J: VW-ET180EO) CIRCUIT BOARDS

TV DEMODULATOR C. BOARD (VEP07221H/J)

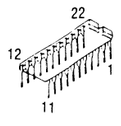
P702
1 AFC OUT
2 AFC IN
3 GND

P701
1 AUDIO OUT
2 GND
3 VIDEO
4 GND
5 +12V

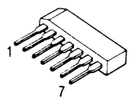


TUNER C. BOARD (VEP07222H/J)

ICs & TRANSISTORs INFORMATION



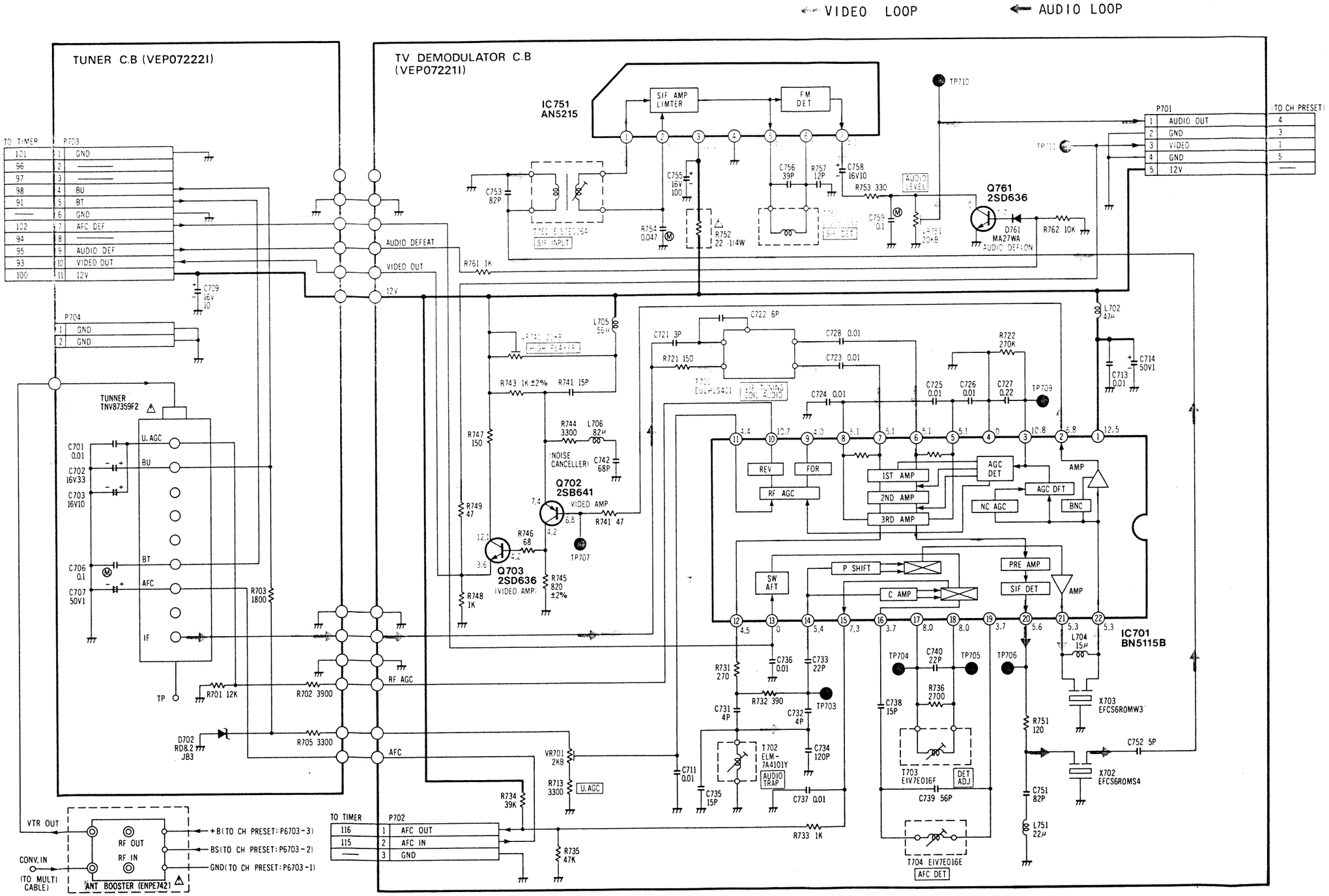
BN5115B



AN5215

2SB641
2SD636

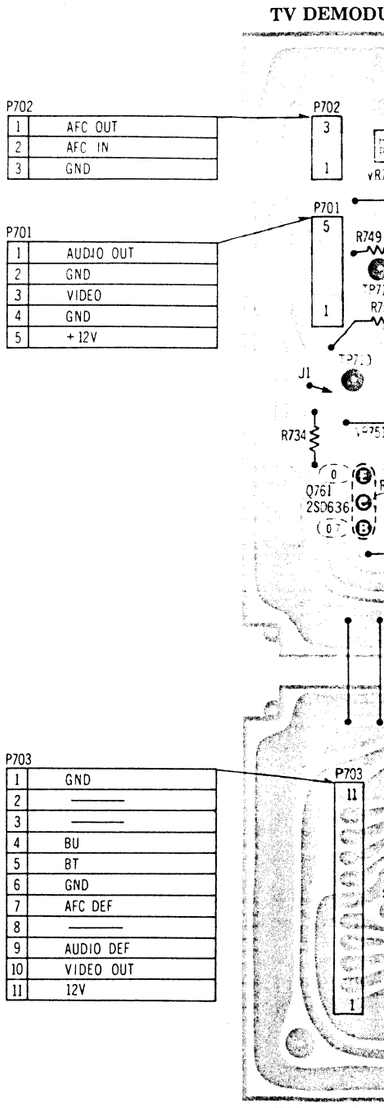
14. TV DEMODULATOR SCHEMATIC DIAGRAM (VW-ET180B)



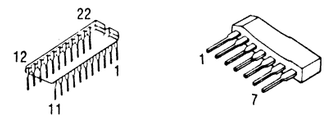
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

15. TV DEMODULATOR CIRCUIT BOARDS



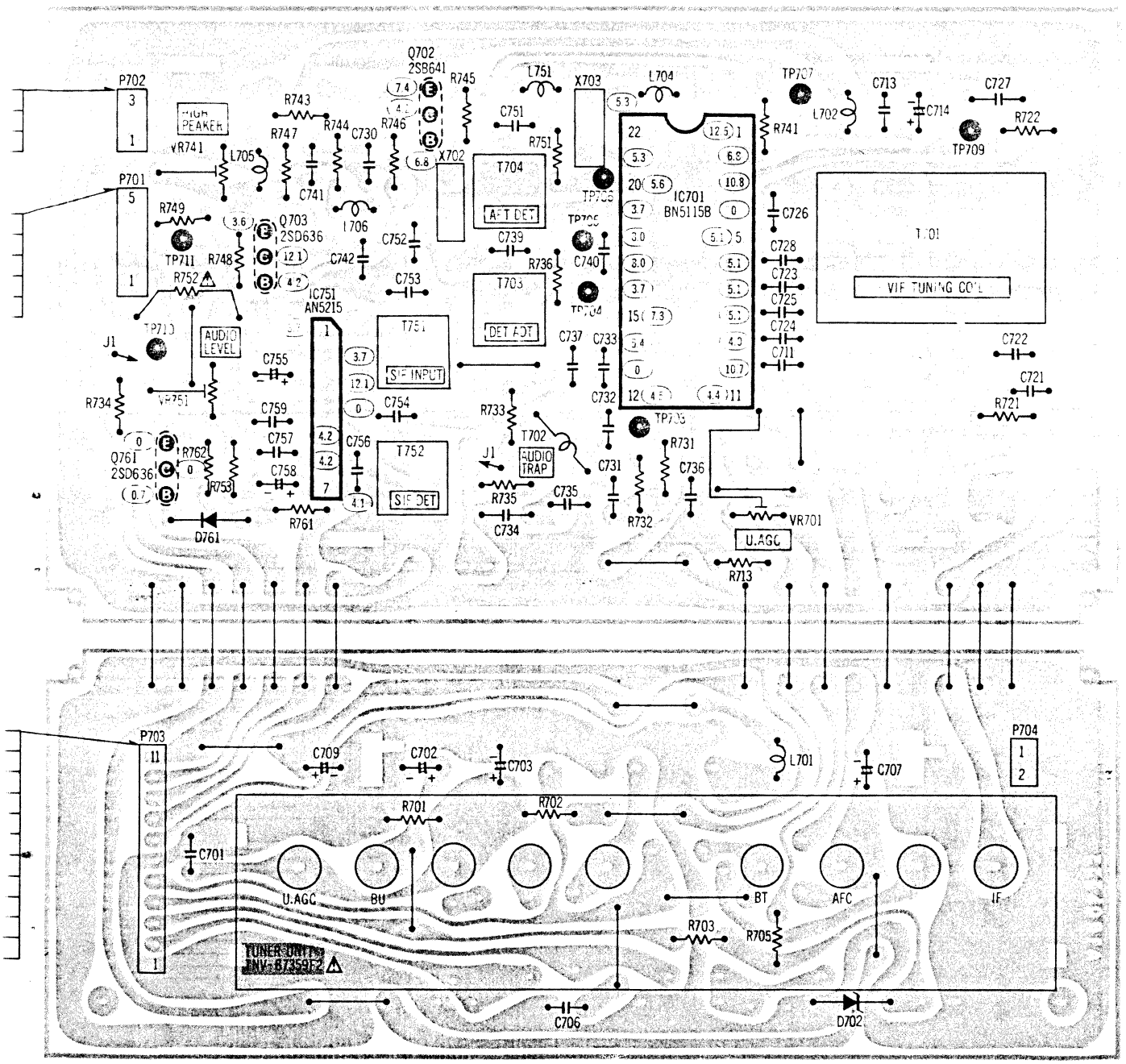
ICs & TRANSISTORs INFORMATION



BN5115B AN5215

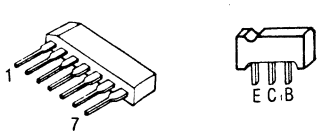
DULATOR (VEP07221I) & TUNER (VEP07222I) BOARDS

TV DEMODULATOR C. BOARD (VEP07221I)



TUNER C. BOARD (VEP07222I)

Rs INFORMATION

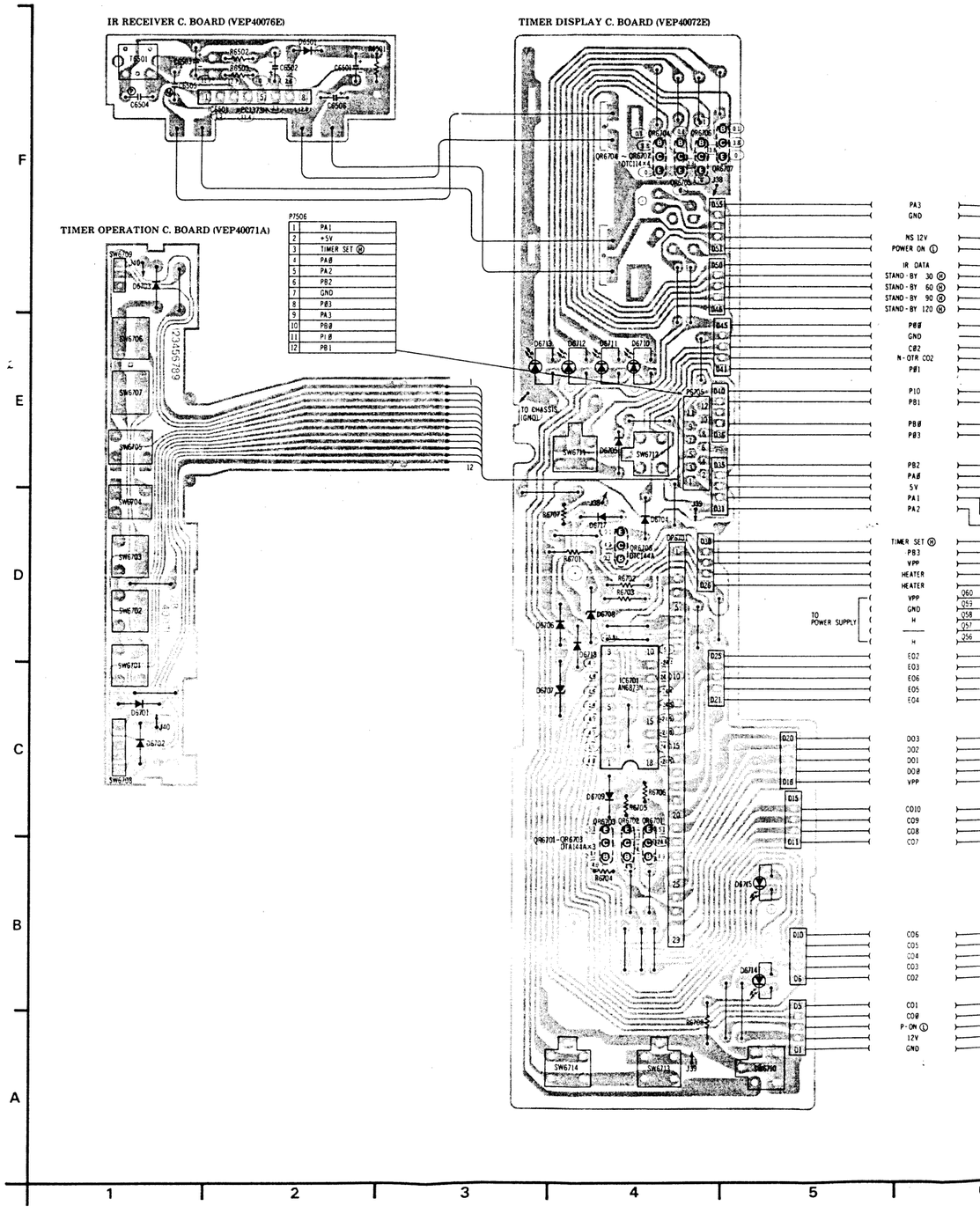


AN5215

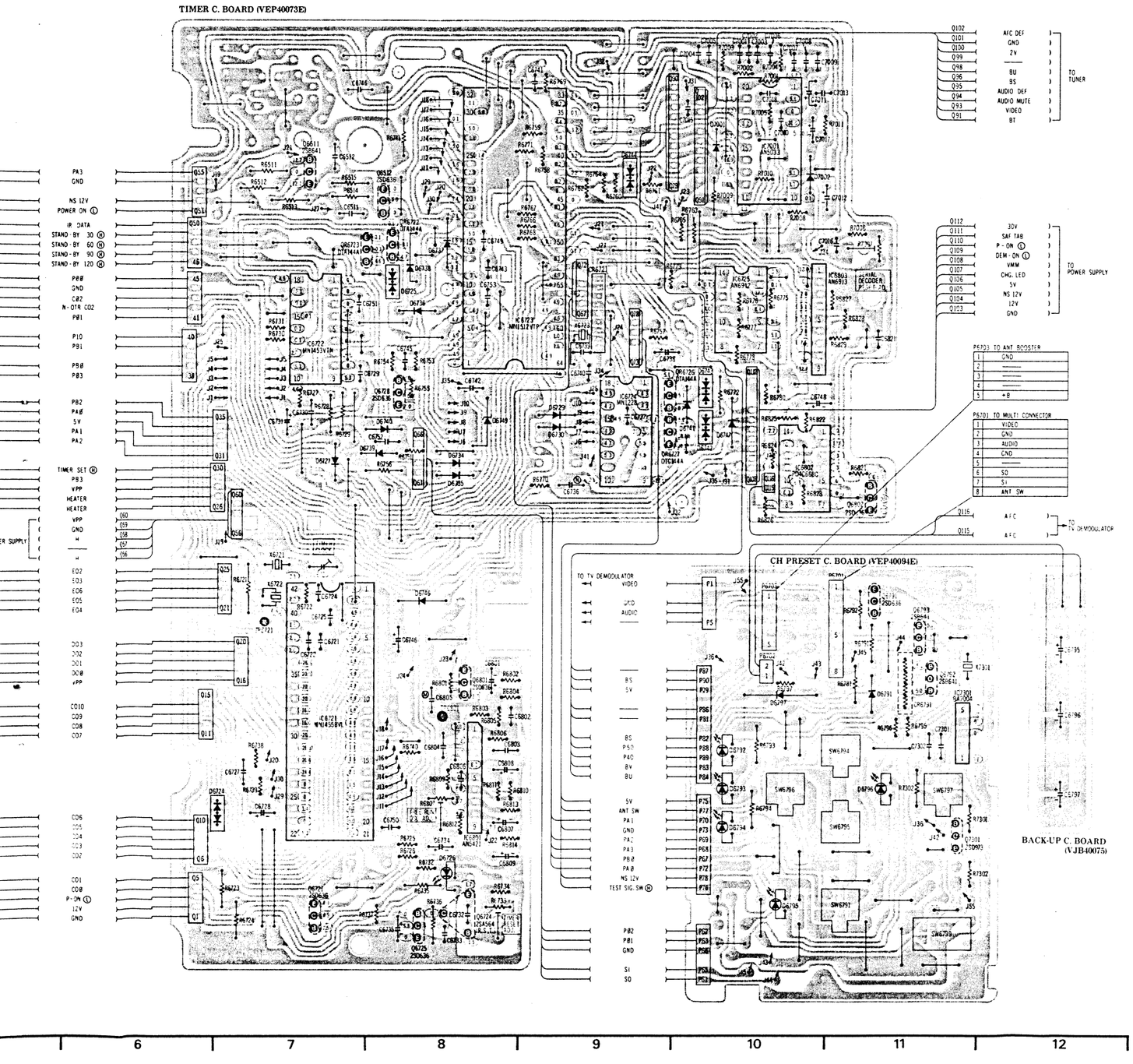
2SB641
2SD636

Next Page:
TIMER Section

16. TIMER [Timer Operation (VEP40071A)/Timer Display (VEP40072E)/Timer (VEP40073E)/CH Preset (VEP40094E)/IR Receiver (VEP40076E)] CIRCUIT BOARDS (VW-ET180E/EO)



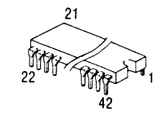
Receiver



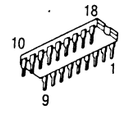
TIMER, CH PRESET, TIMER DISPLAY & IR RECEIVER CIRCUIT BOARD	
Transistor	
Q6511	F-7
Q6512	F-8
Q6721	A-7
Q6724	A-8
Q6725	A-8
Q6728	E-8
Q6791	C-11
Q6792	C-11
Q6793	C-11
Q6801	C-8
Q6802	D-11
Q7301	A-11
Transistor & Resistor	
QR6701	C-4
QR6702	B-4
QR6703	B-4
QR6704	F-4
QR6705	F-4
QR6706	F-4
QR6707	F-5
QR6708	D-4
QR6722	F-8
QR6723	E-7
QR6726	E-10
QR6727	D-10
Integrated Circuit	
IC6501	F-2
IC6701	C-4
IC6721	B-7
IC6722	E-7
IC6723	E-9
IC6724	E-9
IC6725	E-10
IC6801	B-8
IC6802	C-10
IC6803	E-11
IC7001	F-10
IC7301	C-11
Adjustment	
C6723	C-7
R6733	A-8
R6807	B-8
R7007	F-11
T6501	F-1

ADDRESS INFORMATION

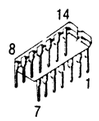
ICs & TRANSISTORs INFORMATION



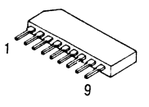
MN1455BVL



MN1453VTN
MN1219
AN6873N

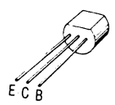


AN6912
μPD4066BC

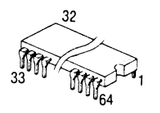


AN5421
AN6913

2SB641
2SD636
2SD973

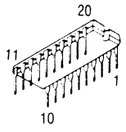


2SA564

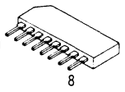


MN1512VIP

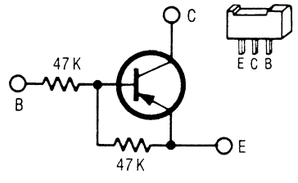
BA7004



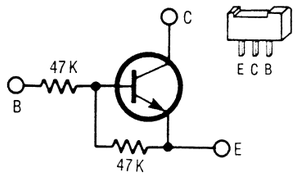
AN5033



μPC1373H



DTA144A

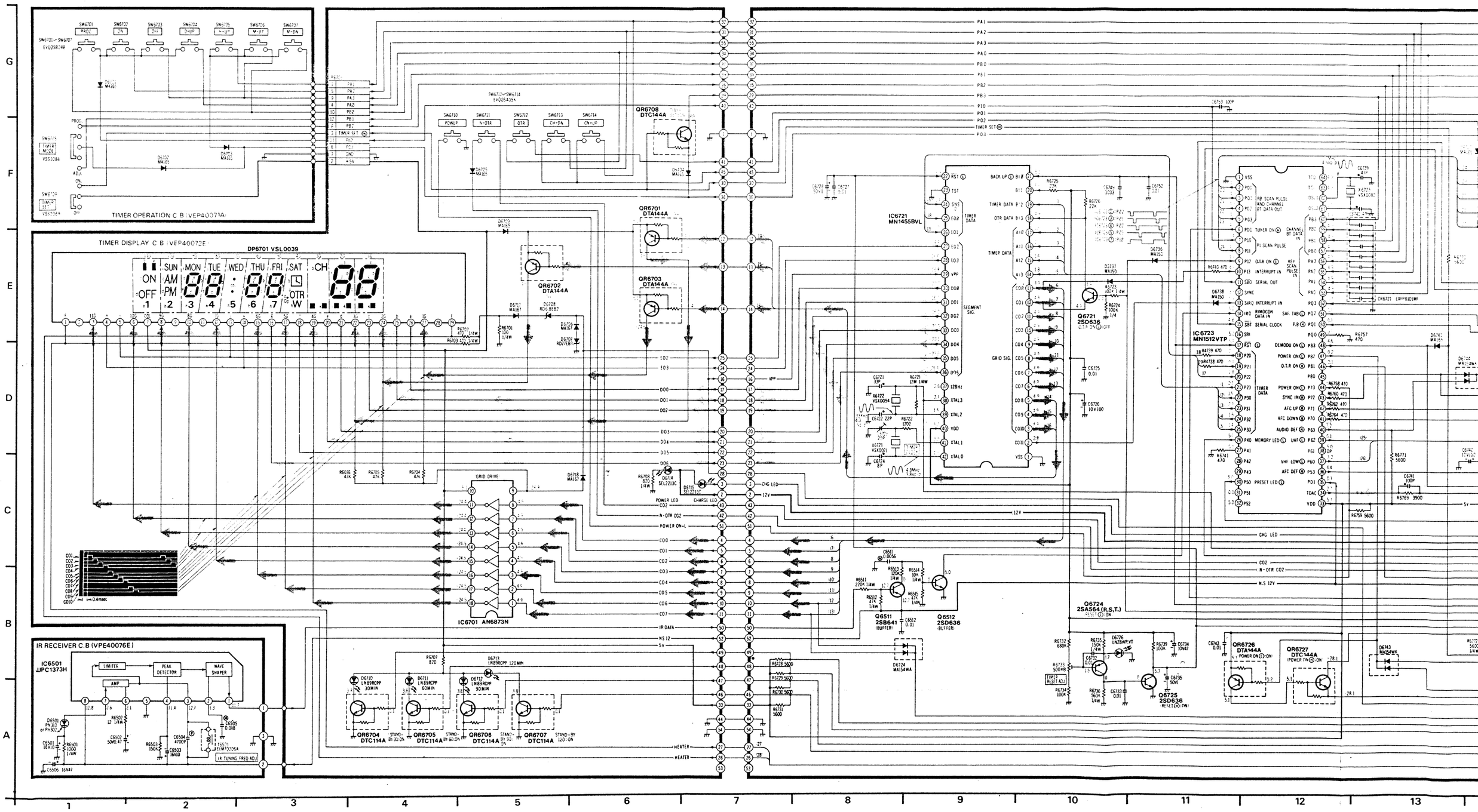


DTC144A

TIMER, CH PRESET, TIMER DISPLAY & IR RECEIVER SCHEMATIC	
Transistor	
Q6511	B-8
Q6512	B-9
Q6721	E-10
Q6724	B-10
Q6725	A-11
Q6728	F-17
Q6791	E-22
Q6792	F-23
Q6793	F-24
Q6801	B-24
Q6802	C-19
Q7301	E-26
Transistor & Resistor	
QR6701	F-6
QR6702	E-5
QR6703	E-6
QR6704	A-4
QR6705	A-4
QR6706	A-5
QR6707	A-5
QR6708	F-6
QR6722	B-17
QR6723	B-17
QR6726	B-12
QR6727	B-12
Integrated Circuit	
IC6501	A-1
IC6701	B-5
IC6721	F-9
IC6722	C-15
IC6723	E-12
IC6724	E-15
IC6725	C-18
IC6801	C-25
IC6802	B-20
IC6803	C-22
IC7001	F-18
IC7301	F-17
Adjustment	
C6723	D-8
R6733	B-10
R6807	B-25
R7007	F-19
T6501	A-2
Connector	
P102	B-28
P103	A-28
P104	D-28
P701	F-28
P702	C-28
P703	D-28
P6701	G-26
P6702	E-27
P6703	G-26
P6705	G-3

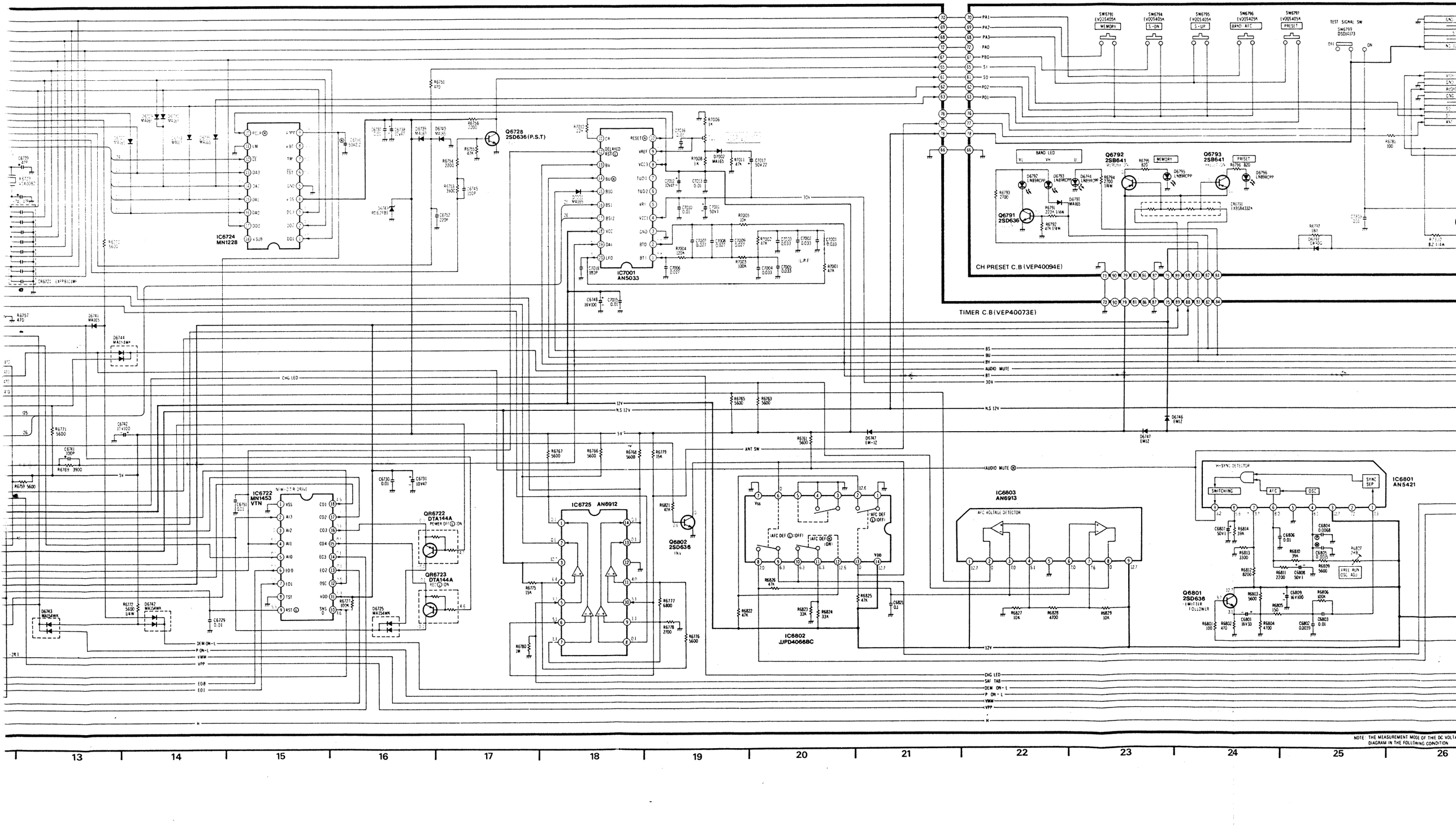
ADDRESS INFORMATION

17. TIMER [Timer Operation/Timer Display/Timer/CH Preset/ IR Receiver] SCHEMATIC DIAGRAM (VW-ET180E/EO)



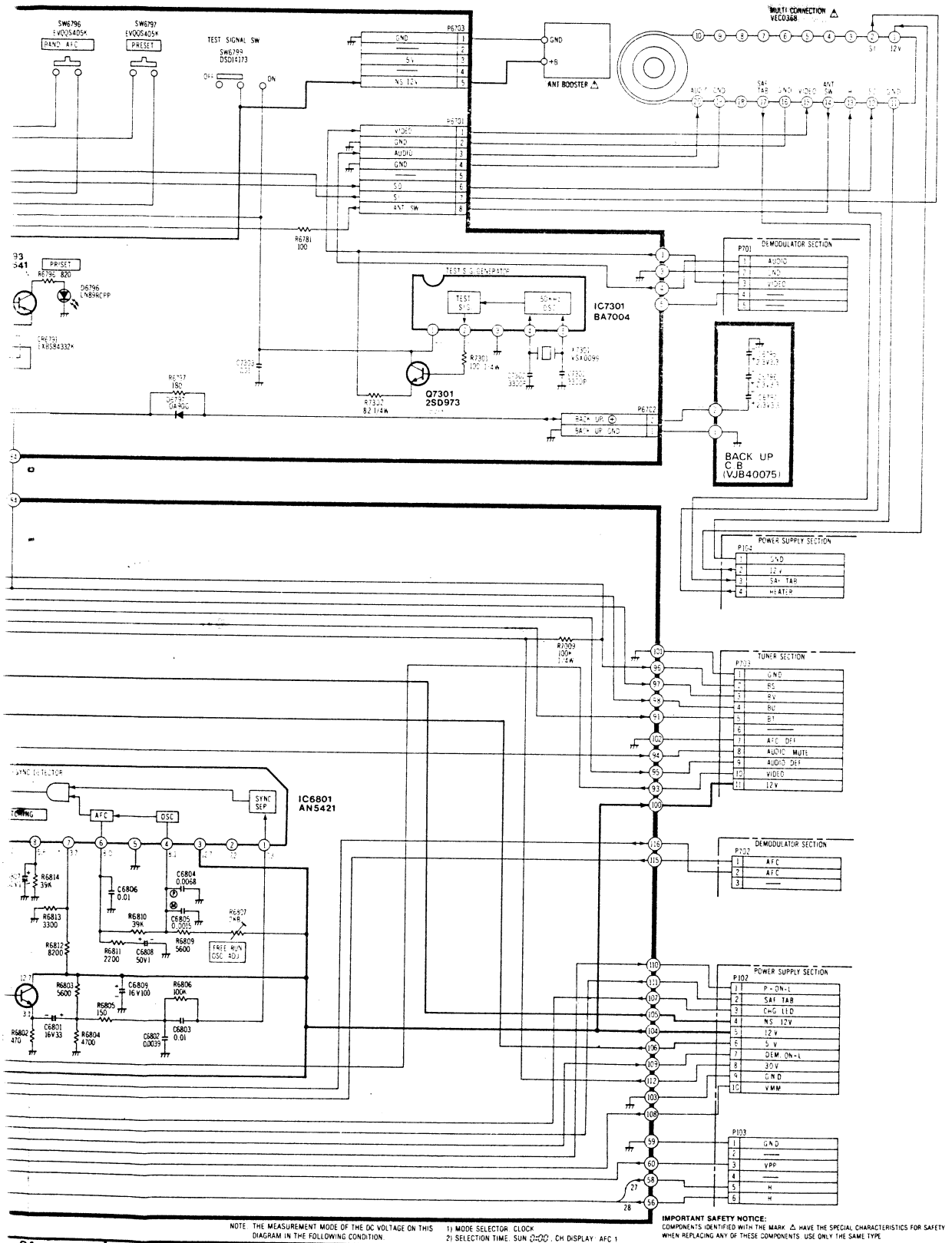
SIGNAL

BT (CHANNEL) DATA TRANSMISSION LOOP



NOTE: THE MEASUREMENT MODE OF THE DC VOLTA
DIAGRAM IN THE FOLLOWING CONDITION

13 14 15 16 17 18 19 20 21 22 23 24 25 26



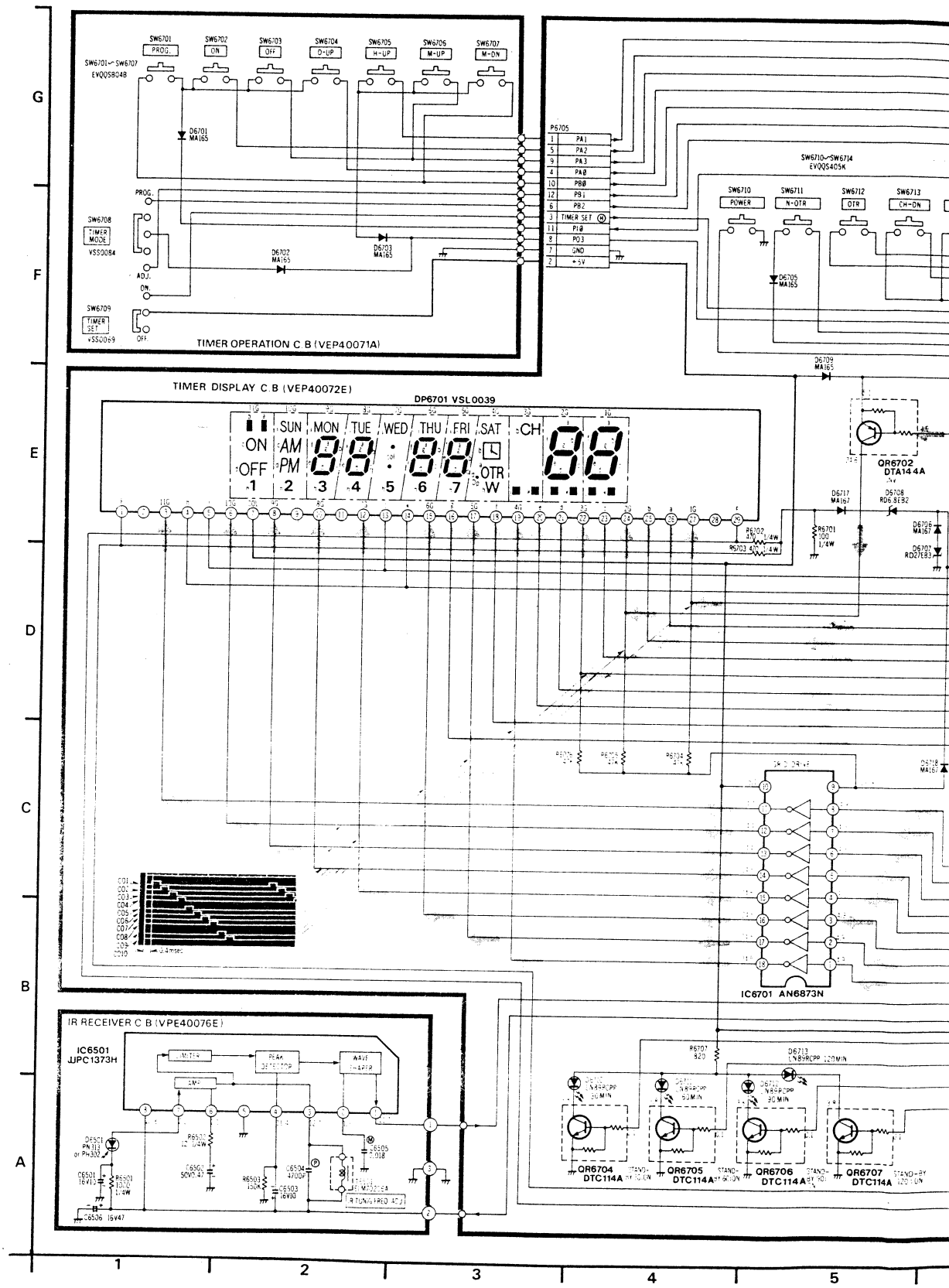
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IN THE FOLLOWING CONDITION.
1) MODE SELECTOR: CLOCK
2) SELECTION TIME: SUN 0:00, CH DISPLAY: AFC 1

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK △ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SAME TYPE.

24 25 26 27 28

Next Page:
TIMER Section

18. TIMER [Timer Opertion/Timer Display/Timer/CH Preset/ IR Receiver] SCHEMATIC DIAGRAM (VW-ET180B)

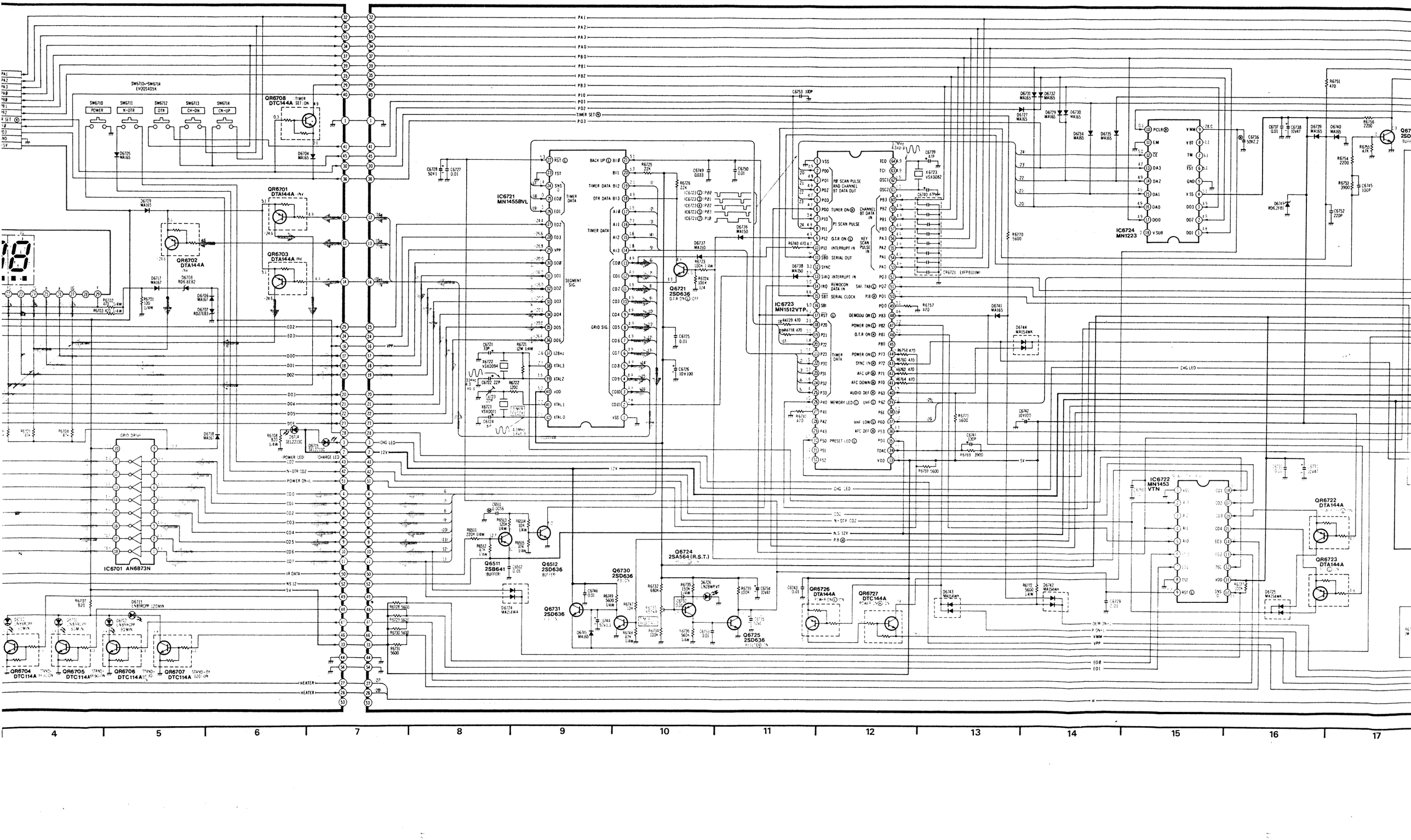


ıy/Timer/CH Preset/
M (VW-ET180B)

SEGMENT CONTROL SIGNAL

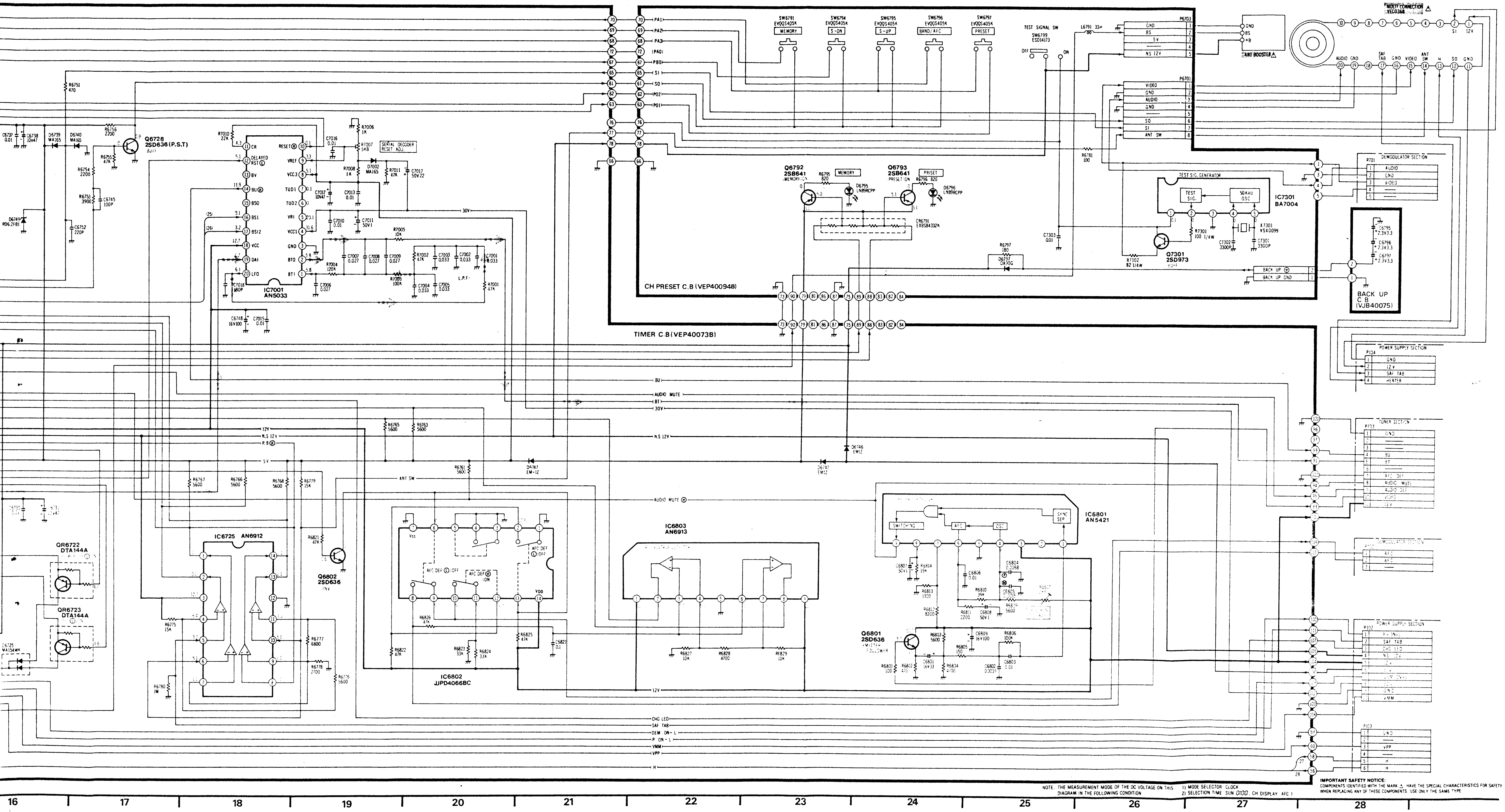
GRID CONTROL SIGNAL

BT (CHANNEL) DATA TRANSMISSION LOOP



4 5 6 7 8 9 10 11 12 13 14 15 16 17

0P



Q6728
2SD636(P,S,T)
BUFF
R6751 470
R6756 2200
R6755 47K
R6754 2200
R6753 3900
C6745 100P
C6752 220P
C6737 0.01
C6738 10V47
D6739 MA165
D6740 MA165
D6749 RD6.2FB1
R7010 22K
R7006 1K
R7007 5KB
SERIAL DECODER RESET ADJ.
C7016 0.01
R7008 1K
D7002 MA165
R7011 47K
C7017 50V22
C7012 10V47
C7013 0.01
C7010 0.01
C7011 50V1
R7005 10K
C7007 0.027
C7008 0.027
C7009 0.027
R7002 47K
C7003 0.033
C7002 0.033
C7001 0.033
R7004 120K
R7003 100K
C7004 0.033
C7005 0.033
R7001 47K
L.P.F
C7006 0.027
C7018 180P
IC7001
AN5033
CR
DELAYED RST
BV
BU
BSO
BS1
BS12
VCC
DAI
LFO
RESET
VREF
VCC3
TUD1
TUD2
VR1
VCC1
GND
BTO
BT1
C6748 16V100
C7015 0.01
30V
PA1
PA2
PA3
(PA0)
PB0
S1
S0
PO2
PO1
SW6791 EVQQS405K MEMORY
SW6794 EVQQS405K S-DN
SW6795 EVQQS405K S-UP
SW6796 EVQQS405K BAND/AFC
SW6797 EVQQS405K PRESET
TEST SIGNAL SW
SW6799 ESD14173
OFF
ON
L6791 33μ
P6703
GND
BS
5V
NS 12V
ANT BOOSTER
GND
BS
+B
MULTI CONNECTION
VEC0368
S1
12V
AUDIO
GND
SAF TAB
GND
VIDEO
ANT SW
H
SO
GND
P6701
VIDEO
GND
AUDIO
GND
SO
SI
ANT SW
R6781 100
Q6792
2SB641
MEMORY:ON
R6795 820
MEMORY
D6795 LN89RCPP
Q6793
2SB641
PRESET:ON
PRISET
R6796 820
D6796 LN89RCPP
CR6791 EXBS84332K
C7303 0.01
R6797 180
D6797 OA90G
TEST SIG. GENERATOR
TEST SIG.
50KHz OSC
IC7301
BA7004
R7301 100 1/4W
X7301 VSX0099
C7302 3300P
C7301 3300P
Q7301
2SD973
BUFF
R7302 82 1/4W
BACK UP ⊕
BACK UP GND
C6795 2.3V3.3
C6796 2.3V3.3
C6797 2.3V3.3
BACK UP C.B (VJB40075)
DEMODULATOR SECTION
P701
AUDIO
GND
VIDEO
CH PRESET C.B (VEP400948)
TIMER C.B(VEP40073B)
POWER SUPPLY SECTION
P104
GND
12V
SAF TAB
HEATER
BU
AUDIO MUTE
BT
30V
12V
N.S 12V
P.B Ⓗ
5V
R6765 5600
R6763 5600
D6746 EM1Z
D6747 EM-1Z
D6747 EM1Z
R6761 5600
ANT SW
R6767 5600
R6766 5600
R6768 5600
R6779 15K
AUDIO MUTE Ⓗ
QR6722
DTA144A
QR6723
DTA144A
D6725 MA154WK
IC6725 AN6912
R6775 15K
R6780 1M
R6777 6800
R6778 2700
R6776 5600
R6821 47K
Q6802
2SD636
INV
Vss
AFC DEF Ⓛ:OFF
AFC DEF Ⓗ:ON
VDD
R6826 47K
R6822 47K
R6823 33K
R6824 33K
R6825 47K
C6821 0.1
IC6802
μPD4066BC
IC6803
AN6913
R6827 10K
R6828 4700
R6829 10K
SWITCHING
AFC
OSC
SYNC SEP
IC6801
AN5421
C6807 50V1
R6814 39K
R6813 3300
C6806 0.01
C6804 0.0068
C6805 0.0015
R6810 39K
R6811 2200
C6808 50V1
R6809 5600
R6812 8200
Q6801
2SD636
EMITTER FOLLOWER
R6803 5600
C6809 16V100
R6806 100K
R6805 150
C6801 16V33
R6801 100
R6802 470
R6804 4700
C6802 0.0039
C6803 0.01
CHG LED
SAF TAB
DEM ON-L
P ON-L
VMM
VPP
H
TUNER SECTION
P703
GND
BU
BT
AFC DEF
AUDIO MUTE
AUDIO DEF
VIDEO
12V
DEMODULATOR SECTION
AFC
AFC
POWER SUPPLY SECTION
P102
P-ON-L
SAF TAB
CHG LED
NS 12V
12V
DEM ON-L
GND
VMM
P103
GND
VPP
H
H
16
17
18
19
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21
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28

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IN THE FOLLOWING CONDITION
1) MODE SELECTOR: CLOCK
2) SELECTION TIME SUN 0:00, CH DISPLAY AFC 1

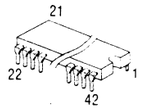
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SAME TYPE

19. TIMER [Timer Operation (VEP40071A)/Timer Display (VEP40072E)/Timer (VEP40073B)/CH Preset (VEP40094B)/IR Receiver (VEP40096E)] CIRCUIT B

TIMER, CH PRESET, TIMER DISPLAY & IR RECEIVER SCHEMATIC	
Transistor	
Q6511	B-8
Q6512	B-9
Q6521	E-10
Q6724	B-10
Q6725	A-11
Q6728	F-17
Q6730	B-10
Q6731	B-9
Q6792	F-23
Q6793	F-24
Q6801	B-24
Q6802	C-19
Q7301	E-26
Transistor & Resistor	
QR6701	F-6
QR6702	E-5
QR6703	E-6
QR6704	A-4
QR6705	A-4
QR6706	A-5
QR6707	A-5
QR6708	F-6
QR6722	B-17
QR6723	B-17
QR6726	B-12
QR6727	B-12
Integrated Circuit	
IC6501	A-1
IC6701	B-5
IC6721	F-9
IC6722	C-15
IC6723	E-12
IC6724	E-15
IC6725	C-18
IC6801	C-25
IC6802	B-20
IC6803	C-22
IC7001	F-18
IC7301	F-17
Adjustment	
C6723	D-8
R6733	B-10
R6807	B-25
R7007	F-19
T6501	A-2
Connector	
P102	B-28
P103	A-28
P104	D-28
P701	F-28
P702	C-28
P703	D-28
P6701	G-26
P6702	E-27
P6703	G-26
P6705	G-3

ADDRESS INFORMATION

ICs & TRANSISTORs INFORMATION



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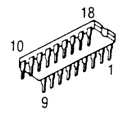

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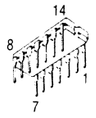
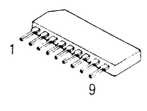
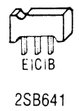
MN1219
AN6873N



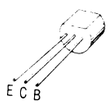
AN6912
μPD4066BC



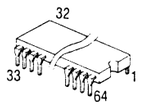
AN5421
AN5913



2SB641
2SD636
2SD973

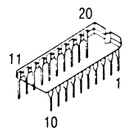


2SA564

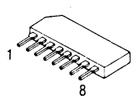


MN1512VIP

BA7004



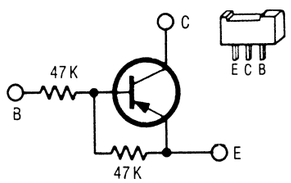
AN5033



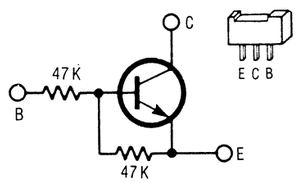
μPC1373H

TIMER, CH PRESET, TIMER DISPLAY & IR RECEIVER CIRCUIT BOARD	
Transistor	
Q6511	F-7
Q6512	F-8
Q6721	A-7
Q6724	A-8
Q6725	A-8
Q6728	E-8
Q6730	F-7
Q6731	F-7
Q6792	C-11
Q6793	C-11
Q6801	C-8
Q6802	D-11
Q7301	A-11
Transistor & Resistor	
QR6701	C-4
QR6702	B-4
QR6703	B-4
QR6704	F-4
QR6705	F-4
QR6706	F-4
QR6707	F-5
QR6708	D-4
QR6722	F-6
QR6723	E-7
QR6726	E-10
QR6727	D-10
Integrated Circuit	
IC6501	F-2
IC6701	C-4
IC6721	B-7
IC6722	E-7
IC6723	E-9
IC6724	E-9
IC6725	E-10
IC6801	B-8
IC6802	C-10
IC6803	E-11
IC7001	F-10
IC7301	C-11
Adjustment	
C6723	C-7
R6733	A-8
R6807	B-8
R7007	F-11
T6501	F-1

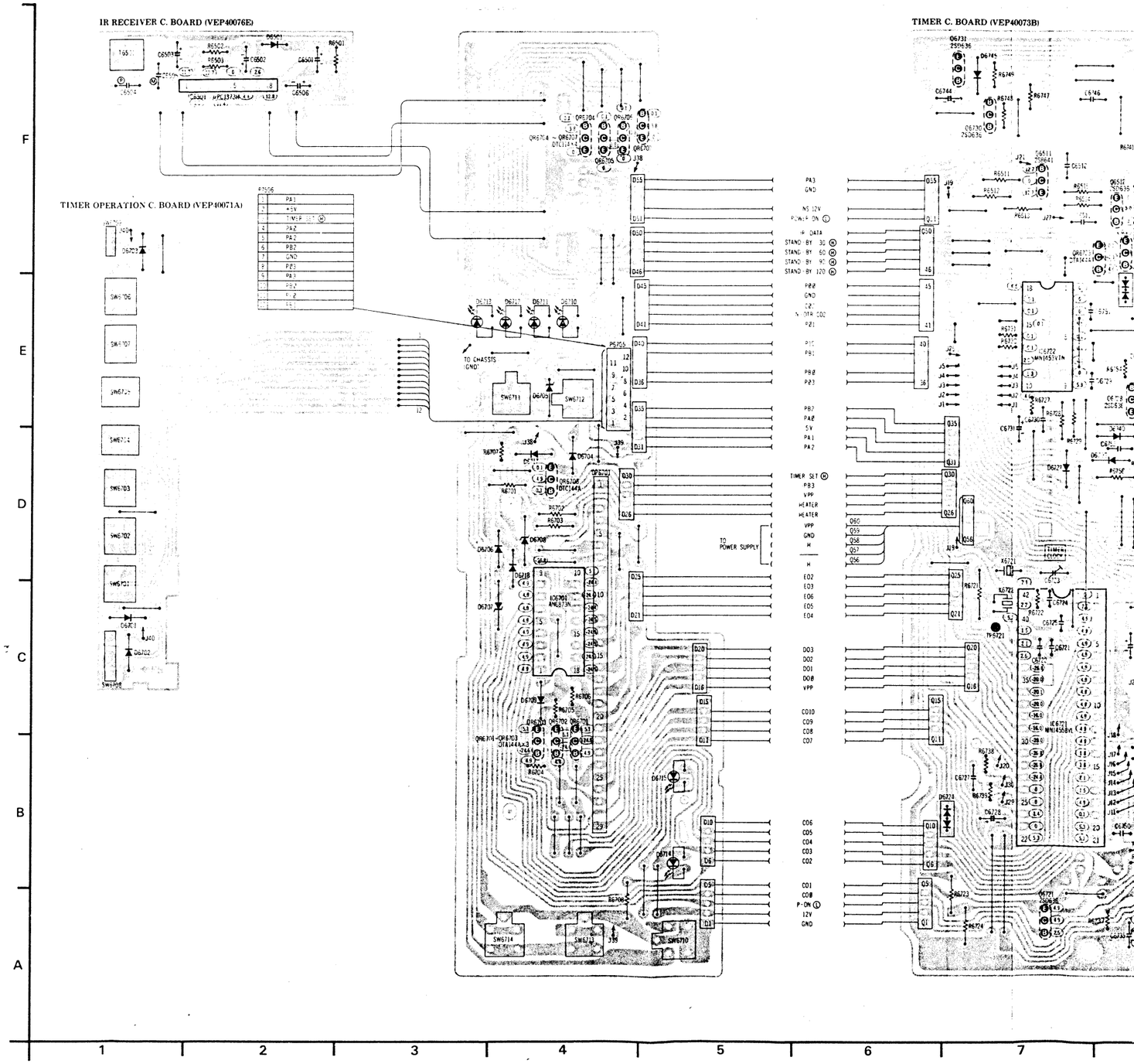
ADDRESS INFORMATION



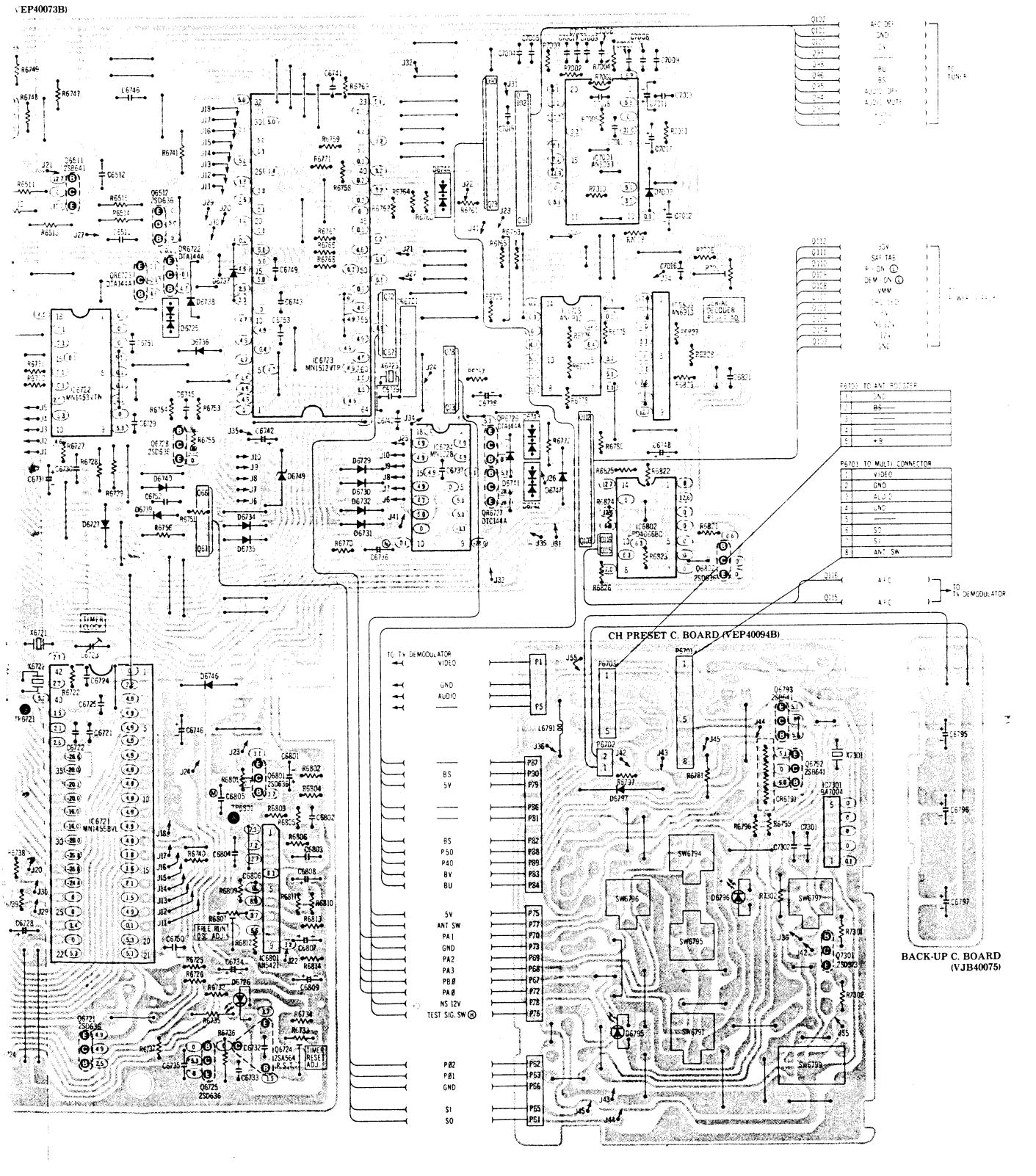
DTA144A



DTC144A



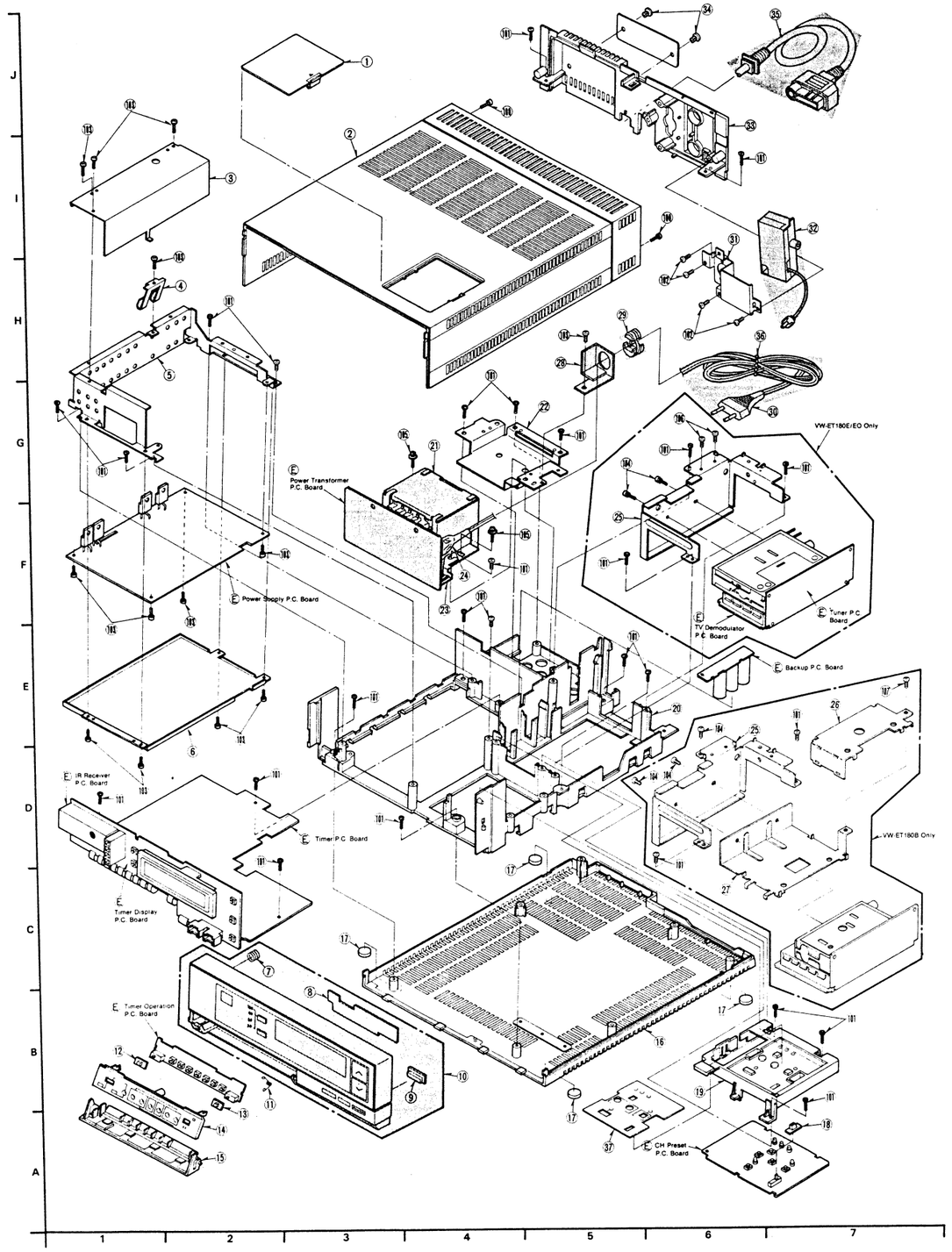
CIRCUIT BOARDS (VW-ET180B)



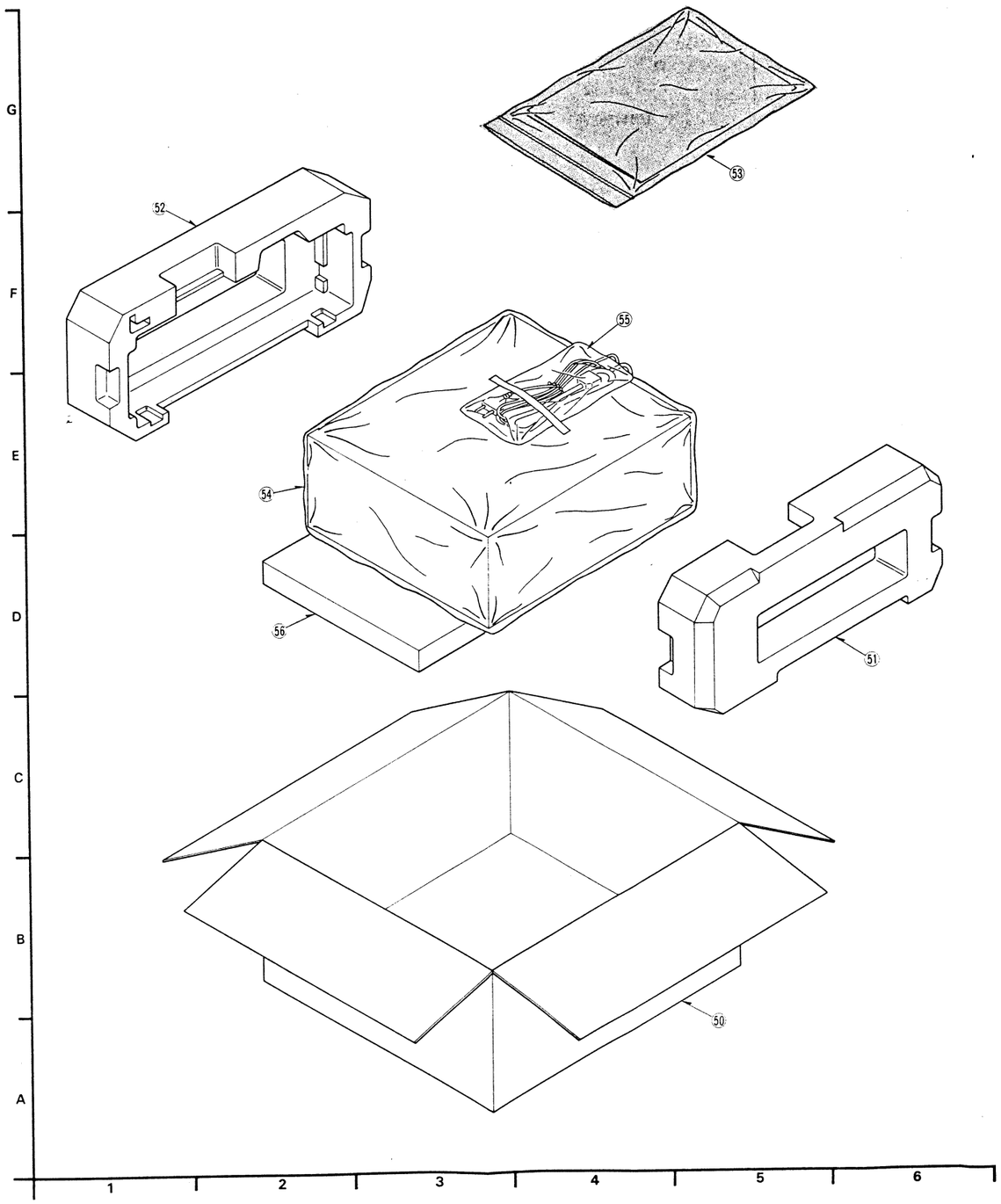
Next Page:
CIRCUIT BOARD LAYOUT
EXPLODED VIEWS

21. EXPLODED VIEWS

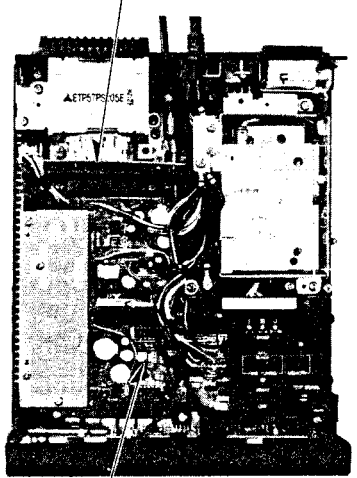
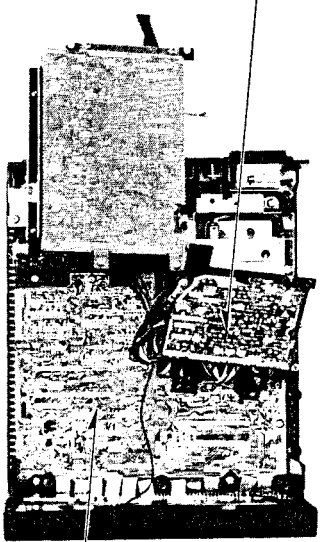
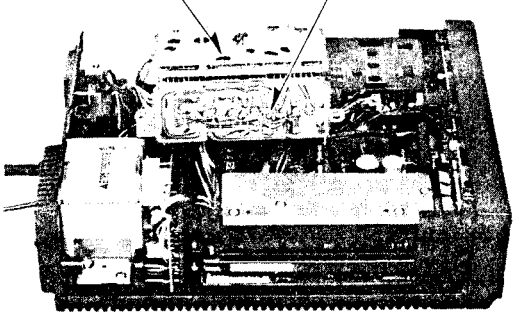
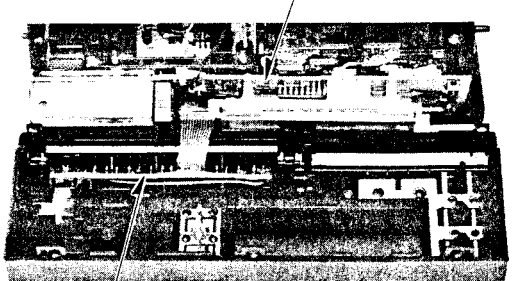
❶ CHASSIS/CABINET



❷ PACKING PARTS SECTION



20. CIRCUIT BOARD LAYOUT

TOP VIEW (1)	TOP VIEW (2)
POWER TRANSFORMER C. BOARD  POWER SUPPLY C. BOARD	CH PRESET C. BOARD  TIMER C. BOARD
SIDE VIEW	**FRONT VIEW**
TV DEMODULATOR C. BOARD TUNER C. BOARD 	TIMER DISPLAY C. BOARD  TIMER OPERATION C. BOARD

Next Page:
TIMER Section

22. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VYF0456	CH Preset Door Unit	1	VW-ET180E/EO (Black)
1(1)	VYF0394	CH Preset Door Unit	1	VW-ET180EO (Silver)
1(1)	VYF0412	CH Preset Door Unit	1	VW-ET180B
2(1)	VYK0765	Top Case Unit	1	VW-ET180E/EO(Black)/B
2(1)	VYK0770	Top Case Unit	1	VW-ET180EO (Silver)
3(1)	VSC1100	Power Shield Case (Top)	1	
4(1)	VMC0064	TR Spring	1	
5(1)	VMP0417	Power Supply Angle	1	
6(1)	VSC1150	Power Shield Case(Bottom)	1	
7(1)	VMB1009	Earth Spring	1	
8(1)	VKW0300	FIP Filter	1	
9(1)	VGU1228	Power Button	1	
10(1)	VYP1079	Front Panel Unit	1	VW-ET180E/EO(Black)/B*
10(1)	VYP1084	Front Panel Unit	1	VW-ET180EO (Silver)*
11(1)	VMB1250	Timer Door Lock Spring	1	
12(1)	VGU1188	Timer Set Knob	1	
13(1)	VGU1186	Timer Rec Knob	1	
14(1)	VXU0291	Timer Preset Button	1	
		Bracket		
15(1)	VYF0455	Timer Preset Door Unit	1	VW-ET180E/EO(Black)/B
15(1)	VYF0463	Timer Preset Door Unit	1	VW-ET180EO (Silver)
16(1)	VKM0355	Bottom Case	1	
17(1)	VKA0039	Foot Rubber	4	
18(1)	VGT0257	Test Signal Switch Knob	1	
19(1)	VGQ0610	CH Preset Bracket	1	
19(1)	VXU0301	CH Preset Bracket Unit	1	VW-ET180B
19(1)	VXU0300	CH Preset Bracket Unit	1	VW-ET180EO
20(1)	VMD0603	Chassis Frame	1	
21(1)	ETP57PS205E	Power Transformer	1	VW-ET180E/EO ⚠
21(1)	ETP57PE206E	Power Transformer	1	VW-ET180B ⚠
22(1)	VMP0415	Power Transformer Angle	1	
23(1)	VJP0113	Earth Plate	1	
24(1)	VMX0237	AC Cord Cover	1	⚠
25(1)	VMP0416	TV Demodulator Angle	1	
26(1)	VMP0468	TV Demodulator Angle(Top)	1	VW-ET180B
27(1)	VMP0478	TV Demodulator Angle	1	VW-ET180B
		(Bottom)		
28(1)	VGQ0691	AC Cord Bracket	1	⚠
29(1)	VJF0017	AC Cord Bushing	1	⚠
30(1)	VJA0111	AC Cord	1	VW-ET180E/EO ⚠
30(1)	VJA0112	AC Cord	1	VW-ET180B ⚠
31(1)	VMP0467	Antenna Unit Support	1	
		Angle		
32(1)	ENPE741	Antenna Unit	1	VW-ET180E ⚠
32(1)	ENPE742	Antenna Unit	1	VW-ET180B ⚠
32(1)	ENPE743	Antenna Unit	1	VW-ET180EO ⚠
33(1)	VYP1018	Rear Panel Unit	1	
34(1)	VHN0011	Clip	2	
35(1)	VEC0368	Multi Connector Cable	1	⚠
		Unit		
36(1)	TMM16423	Cord Band	1	
37(1)	VGH0233	CH Preset Name Plate	1	VW-ET180E/EO
-37(1)	VGH0235	CH Preset Name Plate	1	VW-ET180B
50(2)	VPG1710	Packing Case	1	VW-ET180E
50(2)	VPG1711	Packing Case	1	VW-ET180B
50(2)	VPG1712	Packing Case	1	VW-ET180EO (Silver)
50(2)	VPG1794	Packing Case	1	VW-ET180EO (Black)
51(2)	VPN0989	Cushion (R)	1	
52(2)	VPN0990	Cushion (L)	1	
53(2)	VQF1231	Fan Bag Kit	1	VW-ET180E ⚠

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
53(2)	VQF1232	Fan Bag Kit	1	VW-ET180B ⚠
53(2)	VQF1245	Fan Bag Kit	1	VW-ET180EO ⚠
54(2)	VPF0204	Polyethlene Bag (Large)	1	
55(2)	VPF0169	Polyethlene Bag (Small)	1	
56(2)	VPN1098	Bottom Pad	1	
100(1)	XTB4+12AFZ		2	
101(1)	XTN4+12A		25	
102(1)	XTV3+10A		4	
103(1)	XTV3+8B		13	
104(1)	XYN3+E5		2	
105(1)	XYN4+F8S		2	
106(1)	XTV3+6B		2	
107(1)	XTV3+8B		1	VW-ET180B

23. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS (Ω), 1/4W ± 5% carbon. K=1,000Ω, M=1,000KΩ. All capacitors are in MICROFARADS (μF), ± 10% P=μμF.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP07221H	TV Demodulator P.C. Board Unit	1	VW-ET180E
	VEP07221I	TV Demodulator P.C. Board Unit	1	VW-ET180B
	VEP07221J	TV Demodulator P.C. Board Unit	1	VW-ET180EO
	VEP07222H	Tuner P.C. Board Unit	1	VW-ET180E
	VEP07222I	Tuner P.C. Board Unit	1	VW-ET180B
	VEP07222J	Tuner P.C. Board Unit	1	VW-ET180EO
	VEP40071A	Timer Operation P.C. Board Unit	1	
	VEP40072E	Timer Display P.C. Board Unit	1	
	VEP40073B	Timer P.C. Board Unit	1	VW-ET180B
	VEP40073E	Timer P.C. Board Unit	1	VW-ET180E/EO
	VEP40094B	CH Preset P.C. Board Unit	1	VW-ET180B
	VEP40094E	CH Preset P.C. Board Unit	1	VW-ET180E/EO
	VEP40076E	IR Receiver P.C. Borad Unit	1	
	VJB40079	Power Transformer P.C. Board	1	!
	VEP41023A	Power Supply P.C. Board Unit	1	
	VJB40075	Backup P.C. Board Unit	1	
	ENPE741	Antenna Unit	1	VW-ET180E !
	ENPE742	Antenna Unit	1	VW-ET180B !
	ENPE743	Antenna Unit	1	VW-ET180EO !
T101	ETP57PS205E	Power Transformer	1	VW-ET180E/EO !
T101	ETP57PS206E	Power Transformer	1	VW-ET180B !
F101	XBA2C20TR0	Fuse 2A	1	!
F151	XBA2C31TR0	Fuse 3.15A	1	!

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP07221H/I/J	TV Demodulator P.C. Board Unit	1	
		Integrated Circuits		
IC701	BN5115B		1	VIF IC
IC751	AN5215		1	SIF IC
		Transistors		
Q702	2SB641		1	(Q,R,S,T)
Q703	2SD636		1	(S,T)
Q761	2SD636		1	(Q,R,S,T)
		Diodes		
D711,712	MA165		2	VW-ET180E/EO
D761	MA27WA		1	
		Resistors		
R713	ERDS2TJ332	3.3K	1	
R716	ERDS2TJ392	3.9K	1	VW-ET180E/EO
R721	ERDS2TJ151	150	1	VW-ET180E/B
R721	ERDS2TJ181	180	1	VW-ET180EO
R722	ERDS2TJ274	270K	1	
R731	ERDS2TJ271	270	1	
R732	ERDS2TJ391	390	1	
R733	ERDS2TJ102	1K	1	
R734	ERDS2TJ393	39K	1	VW-ET180E/B
R734	ERDS2TJ104	100K	1	VW-ET180EO
R735	ERDS2TJ473	47K	1	VW-ET180E/B
R735	ERDS2TJ104	100K	1	VW-ET180EO
R736	ERDS2TJ272	2.7K	1	
R741	ERDS2TJ470	47	1	
R743	EROS2CKG1001	Metal 1K	1	
R744	ERDS2TJ332	3.3K	1	
R745	EROS2CKG8200	Metal 820	1	
R746	ERDS2TJ680	68	1	
R747	ERDS2TJ151	150	1	
R748	ERDS2TJ102	1K	1	
R749	ERDS2TJ470	47	1	
R751	ERDS2TJ121	120	1	
R752	ERQ14AJ220	Metal 22	1	!
R753	ERDS2TJ331	330	1	
R761	ERDS2TJ102	1K	1	
R762	ERDS2TJ103	10K	1	
		Variable Resistors		
VR701	EVN69AA00B23	2K	1	
VR702	EVN69AA00B23	2K	1	VW-ET180E/EO
VR741	EVNE4AA00B24	20K	1	
VR751	EVNE4AA00B24	20K	1	
		Capacitors		
C711	ECKF1H103ZF	Ceramic 50V 0.01	1	
C713	ECKF1H103ZF	Ceramic 50V 0.01	1	
C721	ECCF1H040CC	Ceramic 50V 4P	1	VW-ET180E
C721	ECCF1H030CC	Ceramic 50V 3P	1	VW-ET180B/EO

Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
C722	ECCF1H050CC	Ceramic	50V	5P	1	VW-ET180E
C722	ECCF1H060CC	Ceramic	50V	6P	1	VW-ET180B/EO
C723-726	ECKF1H103ZF	Ceramic	50V	0.01	4	
C727	ECQV1H224JZ	Mylar	50V	0.22	1	
C728	ECKF1H103ZF	Ceramic	50V	0.01	1	
C730	ECCF1H390JC	Ceramic	50V	39P	1	VW-ET180E
C731,732	ECCF1H040CC	Ceramic	50V	4P	2	
C733	ECCF1H220JC	Ceramic	50V	22P	1	
C734	ECCF1H121JP	Ceramic	50V	120P	1	
C735	ECCF1H150JP	Ceramic	50V	15P	1	
C736,737	ECKF1H103ZF	Ceramic	50V	0.01	2	
C738	ECCF1H150JC	Ceramic	50V	15P	1	
C739	ECCF1H560JR	Ceramic	50V	56P	1	
C740	ECCF1H220JR	Ceramic	50V	22P	1	
C741	ECCF1H150JC	Ceramic	50V	15P	1	
C742	ECCF1H680JC	Ceramic	50V	68P	1	
C751	ECCF1H820JC	Ceramic	50V	82P	1	
C752	ECCF1H050CC	Ceramic	50V	5P	1	
C753	ECCF1H820JP	Ceramic	50V	82P	1	
C754	ECQB1H473JZ	Mylar	50V	0.047	1	
C755	ECEA1CK101	Electrolytic	16V	100	1	
C756	ECCF1H390JR	Ceramic	50V	39P	1	
C757	ECCF1H120JC	Ceramic	50V	12P	1	
C758	ECEA1CK100	Electrolytic	16V	10	1	
C759	ECQB1H104JZ	Mylar	50V	0.1	1	
		Coils				
L702	VLQEL05F470K			47μH	1	
L704	VLQEL05F150K			15μH	1	
L705	VLQEL05F560K			56μH	1	
L706	VLQEL05F820K			82μH	1	
L751	VLQEL05F220K			22μH	1	
		Transformers				
T701	EULHLS301				1	VW-ET180E/EO
T701	EULHLS401				1	VW-ET180B
T702	ELM7A4101Y				1	
T703	EIV7E016F				1	
T704	EIV7E016E				1	
T751	EIS7E006A				1	
T752	EIS7E006B				1	
		Cyrstal Oscillators				
X702	EFCS5R5MS4				1	VW-ET180E/EO
X702	EFCS6R0MS4				1	VW-ET180B
X703	EFCS5R5MW3				1	VW-ET180E/EO
X703	EFCS6R0MW3				1	VW-ET180B
		Connectors				
P701	VJP1245			5P	1	
P702	VJP1243			3P	1	
		Miscellaneous				
	VSC1147	Shield Case (Main)			1	
	VSC1148	Shield Case (Bottom)			1	
	VSC1216	Shield Case (Top)			1	

Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
	VEP07222H/I/J	Tuner P.C. Board Unit				
		Diodes				
D701	RD8.2JB3	Zener			1	VW-ET180E/EO
D702	RD8.2JB3	Zener			1	
		Resistors				
R701	ERDS2TJ123			12K	1	
R702	ERDS2TJ392			3.9K	1	
R703	ERDS2TJ182			1.8K	1	
R704	ERDS2TJ182			1.8K	1	VW-ET180E/EO
R705	ERDS2TJ332			3.3K	1	
R706	ERDS2TJ332			3.3K	1	VW-ET180E/EO
		Capacitors				
C701	ECKJ1H103ZF	Ceramic	50V	0.01	1	
C702	ECEA1CKS220	Electrolytic	16V	22	1	VW-ET180E/EO
C702	ECEA1CK330	Electrolytic	16V	33	1	VW-ET180B
C703	ECEA1CKS100	Electrolytic	16V	10	1	
C704	ECKJ1H103ZF	Ceramic	50V	0.01	1	VW-ET180E/EO
C705	ECEA1CKS330	Electrolytic	16V	33	1	VW-ET180E/EO
C706	ECQB1H104JZ	Mylar	50V	0.1	1	
C707	ECEA1HKS010	Electrolytic	50V	1	1	
C708	ECEA1CKS330	Electrolytic	16V	33	1	VW-ET180E/EO
C709	ECEA1CKS100	Electrolytic	16V	10	1	
		Coil				
L701	VLQEL05F680K			68μH	1	VW-ET180E/EO
		Connectors				
P703	VJP1251			11P	1	
P704	VJP1242			2P	1	
		Miscellaneous				
	TNV77759F2	Tuner			1	VW-ET180E ⚠
	TNV87359F2	Tuner			1	VW-ET180B ⚠
	TNV57756F2R	Tuner			1	VW-ET180EO ⚠
	VEP40071A	Timer Operation P.C. Board Unit			1	
		Diodes				
D6701-6703	MA165				3	
		Switches				
SW6701-6707	EVQQSB04B				7	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
SW6708	VSS0084		1	
SW6709	VSS0069		1	
	VEP40072E	Timer Display P.C.		
		Board Unit		
		Integrated Circuit		
IC6701	AN6873N		1	
		Combination Parts		
		(Transistor & Resistor)		
QR6701-6703	DTA144A		3	or UN1113
QR6704-6707	DTC114A		4	or UN1211
QR6708	DTC144A		1	or UN1213
		Diodes		
D6704,6705	MA165		2	
D6706	MA167		1	
D6707	RD27EB3	Zener	1	
D6708	RD6.8EB3	Zener	1	
D6709	MA165		1	
D6710-6713	LN89RCPP	LED	4	
D6714,6715	SEL2213C	LED	2	
D6717,6718	MA167		2	
		Resistors		
R6701	ERDS2TJ104	100K	1	
R6702,6703	ERDS2TJ471	470	2	
R6704-6706	ERJ8GCYJ473	Chip 1/8W 47K	3	
R6707	ERJ8GCYJ821	Chip 1/8W 820	1	
R6708	ERDS2TJ821	820	1	
		Switches		
SW6710-6714	EVQ0S405K		5	
		Display Tube		
DP6701	VSL0039		1	
		Connector		
P6705	VJS1430	12P	1	
		Miscellaneous		
	VJF0191	Display Tube Hodler	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VKW0147	IR Receiver Filter	1	
	VMX0697	4P LED Holder	1	
	VMX0698	2P LED Holder	1	
	VMX0714	1P LED Holder	1	
	VSC0806	IR Receiver Shield	1	
		Board		
	VSC1104	IR Receiver Shield	1	
		Case (Top)		
	VSC1105	IR Receiver Shield	1	
		Case (Bottom)		
	VEP40073B/E	Timer P.C. Board Unit		
		Integrated Circuits		
IC6721	MN1455BVL		1	
IC6722	MN1453VTN		1	
IC6723	MN1512VIP		1	
IC6724	MN1228		1	
IC6725	AN6912		1	
IC6801	AN5421		1	
IC6802	μPD4066BC		1	
IC6803	AN6913		1	
IC7001	AN5033		1	
		Transistors		
Q6511	2SB641		1	
Q6512	2SD636		1	
Q6721	2SD636		1	
Q6724	2SA564		1	(R,S,T)
Q6725	2SD636		1	
Q6728	2SD636		1	(R,S,T)
Q6730,6731	2SD636		2	VW-ET180B
Q6801,6802	2SD636		2	
		Combination Parts		
QR6722,6723	DTA144A		2	or UN1113
QR6726	DTA144A		1	or UN1113
QR6727	DTC144A		1	or UN1213
		Diodes		
D6724	MA154WA		1	
D6725	MA154WK		1	
D6726	LN28WPVT	LED	1	
D6727	MA165		1	
D6729,6730	MA165		2	
D6731,6732	MA165		2	VW-ET180B
D6734-6736	MA165		3	
D6737,6738	MA150		2	
D6739-6741	MA165		3	
D6742-6744	MA154WK		3	
D6745	MA165		1	VW-ET180B
D6747	EM1Z		1	

Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
D6749	RD6.2FB1	Zener			1	
D7001	MA165				1	VW-ET180E/EO
D7002	MA165				1	
		Resistors				
R6511	ERDS2TJ224			220K	1	
R6512	ERDS2TJ473			47K	1	
R6513	ERDS2TJ124			120K	1	
R6514	ERDS2TJ103			10K	1	
R6515	ERDS2TJ473			47K	1	
R6721	ERC14GJ126	Solid		12M	1	
R6722	ERJ8GCYJ122	Chip	1/8W	1.2K	1	
R6723,6724	ERDS2TJ104			100K	2	
R6725,6726	ERJ8GCYJ223	Chip	1/8W	22K	2	
R6727	ERJ8GCYJ104	Chip	1/8W	100K	1	
R6728,6729	ERDS2TJ562			5.6K	2	
R6730,6731	ERJ8GCYJ562	Chip	1/8W	5.6K	2	
R6732	ERJ8GCYJ684	Chip	1/8W	680K	1	
R6733	EVNC3AA00B55	Variable		500K	1	
R6734	ERJ8GCYJ104	Chip	1/8W	100K	1	
R6735	ERDS2TJ154			150K	1	
R6736	ERDS2TJ564			560K	1	
R6737	ERJ8GCYJ104	Chip	1/8W	100K	1	
R6738-6740	ERJ8GCYJ471	Chip	1/8W	470	3	
R6741	ERDS2TJ471			470	1	
R6747	ERDS2TJ103			10K	1	VW-ET180B
R6748	ERDS2TJ473			47K	1	VW-ET180B
R6749	ERDS2TJ562			5.6K	1	VW-ET180B
R6751	ERJ8GCYJ471	Chip		470	1	
R6753	ERJ8GCYJ392	Chip	1/8W	3.9K	1	
R6754	ERJ8GCYJ222	Chip	1/8W	2.2K	1	
R6755	ERJ8GCYJ473	Chip	1/8W	47K	1	
R6756	ERDS2TJ222			2.2K	1	
R6757,6758	ERJ8GCYJ471	Chip	1/8W	470	2	
R6759	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6760	ERJ8GCYJ471	Chip	1/8W	470	1	
R6761	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6762	ERJ8GCYJ471	Chip	1/8W	470	1	
R6763	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6764	ERJ8GCYJ471	Chip	1/8W	470	1	
R6765-6768	ERJ8GCYJ562	Chip	1/8W	5.6K	4	
R6769	ERJ8GCYJ392	Chip	1/8W	3.9K	1	
R6770,6771	ERJ8GCYJ562	Chip	1/8W	5.6K	2	
R6772	ERDS2TJ562			5.6K	1	
R6775	ERJ8GCYJ153	Chip	1/8W	15K	1	
R6776	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6777	ERJ8GCYJ682	Chip	1/8W	6.8K	1	
R6778	ERJ8GCYJ272	Chip	1/8W	2.7K	1	
R6779	ERJ8GCYJ153	Chip	1/8W	15K	1	
R6780	ERJ8GCYJ105	Chip	1/8W	1M	1	
R6801	ERJ8GCYJ101	Chip	1/8W	100	1	
R6802	ERJ8GCYJ471	Chip	1/8W	470	1	
R6803	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6804	ERJ8GCYJ472	Chip	1/8W	4.7K	1	
R6805	ERJ8GCYJ151	Chip	1/8W	150	1	
R6806	ERJ8GCYJ104	Chip	1/8W	100K	1	
R6807	EVNC3AA00B23	Variable		2K	1	
R6809	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R6810	ERJ8GCYJ393	Chip	1/8W	39K	1	
R6811	ERJ8GCYJ222	Chip	1/8W	2.2K	1	
R6812	ERJ8GCYJ822	Chip	1/8W	8.2K	1	
R6813	ERJ8GCYJ332	Chip	1/8W	3.3K	1	
R6814	ERJ8GCYJ393	Chip	1/8W	39K	1	

Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
R6821,6822	ERJ8GCYJ473	Chip	1/8W	47K	2	
R6823,6824	ERJ8GCYJ333	Chip	1/8W	33K	2	
R6825,6826	ERJ8GCYJ473	Chip	1/8W	47K	2	
R6827	ERJ8GCYJ103	Chip	1/8W	10K	1	
R6828	ERJ8GCYJ472	Chip	1/8W	4.7K	1	
R6829	ERJ8GCYJ103	Chip	1/8W	10K	1	
R7001,7002	ERJ8GCYJ473	Chip	1/8W	47K	2	
R7003	ERJ8GCYJ104	Chip	1/8W	100K	1	
R7004	ERJ8GCYJ124	Chip	1/8W	120K	1	
R7005	ERJ8GCYJ103	Chip	1/8W	10K	1	
R7006	ERJ8GCYJ102	Chip	1/8W	1K	1	
R7007	EVNC3AA00B53	Variable		5K	1	
R7008	ERJ8GCYJ102	Chip	1/8W	1K	1	
R7009	ERDS2TJ104		1/8W	100K	1	VW-ET180E/EO
R7010	ERJ8GCYJ223	Chip	1/8W	22K	1	
R7011	ERJ8GCYJ473	Chip	1/8W	47K	1	
		Capacitors				
C6511	ECQM1H562KZ	Mylar	50V	5600P	1	
C6512	ECKF1H103ZF	Ceramic	50V	0.01	1	
C6721	ECUX1H330JC	Chip	50V	33P	1	
C6722	ECUX1H220JC	Chip	50V	22P	1	
C6723	ECV1ZW20X65	Trimmer	500V	20P	1	
C6724	ECUX1H080DC	Chip	50V	8P	1	
C6725	ECUX1H103ZF	Chip	50V	0.01	1	
C6726	ECEA1AK101	Electrolytic	10V	100	1	
C6727	ECKF1H103ZF	Ceramic	50V	0.01	1	
C6728	ECEA1HK010	Electrolytic	50V	1	1	
C6729	ECUX1H103ZF	Chip	50V	0.01	1	
C6730	ECKF1H103ZF	Ceramic	50V	0.01	1	
C6731	ECEA1AK470	Electrolytic	10V	47	1	
C6732,6733	ECUX1H103ZF	Chip	50V	0.01	2	
C6734	ECEA1AK470	Electrolytic	10V	47	1	
C6735	ECEA1HK010	Electrolytic	50V	1	1	
C6736	ECEA1HKN2R2	Electrolytic	50V	2.2	1	
C6737	ECUX1H103ZF	Chip	50V	0.01	1	
C6738	ECEA1AK470	Electrolytic	10V	47	1	
C6739,6740	ECUX1H470JC	Chip	50V	47P	2	
C6741	ECUX1H101JC	Chip	50V	100P	1	
C6742	ECEA1AK101	Electrolytic	10V	100	1	
C6743	ECUX1H103ZF	Chip	50V	0.01	1	
C6744	ECEA1HK3R3	Electrolytic	50V	3.3	1	VW-ET180B
C6745	ECUX1H101KC	Chip	50V	100P	1	
C6746	ECKF1H103ZF	Ceramic	50V	0.01	1	
C6748	ECEA1CK101	Electrolytic	16V	100	1	
C6749	ECUX1H333KB	Chip	50V	0.033	1	
C6750	ECUX1H103ZF	Chip	50V	0.01	1	
C6751	ECUX1H103ZF	Chip	50V	0.01	1	
C6752	ECKF1H221KB	Ceramic	50V	220P	1	
C6753	ECUX1H101JC	Chip	50V	100P	1	
C6801	ECEA1CK330	Electrolytic	16V	33	1	
C6802	ECUX1H392KB	Chip	50V	3900P	1	
C6803	ECKF1H103ZF	Ceramic	50V	0.01	1	
C6804	ECQP1682JZ	Mylar	100V	6800P	1	
C6805	ECQM1H152JZ	Mylar	50V	1500P	1	
C6806	ECUX1H103KB	Chip	50V	0.01	1	
C6807,6808	ECEA1HK010	Electrolytic	50V	1	2	
C6809	ECEA1CK101	Electrolytic	16V	100	1	
C6821	ECUX1H104ZF	Chip	50V	0.1	1	
C7001-7005	ECUX1H333KB	Chip	50V	0.033	5	
C7006-7009	ECUX1H273KB	Chip	50V	0.027	4	
C7010	ECUX1H103ZF	Chip	50V	0.01	1	
C7011	ECEA1HK010	Electrolytic	50V	1	1	
C7012	ECEA1AK470	Electrolytic	10V	47	1	
C7013	ECUX1H103ZF	Chip	50V	0.01	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C7015,7016	ECUX1H103ZF	Chip 50V 0.01	2	
C7017	ECEA1HK220	Electrolytic 50V 22	1	
C7018	ECUX1H181KB	Chip 50V 180P	1	
		Capacitor Array		
CR6721	EXFP8101MF	100Px8	1	
		Crystal Oscillators		
X6721	VSX0071		1	
X6722	VSX0094		1	
X6723	VSX0082		1	
		Miscellaneous		
	KL02	Spacer	1	
WQ001-024	ERJ8GC0R00	Chip Jumer	24	
	VEP40094B/E	CH Preset P.C. Board		
		Unit		
		Integrated Circuit		
IC7301	BA7004		1	
		Transistors		
Q6791	2SD636		1	VW-ET180E/EO
Q6792,6793	2SB641		2	
Q7301	2SD973		1	
		Diodes		
D6791	MA165		1	VW-ET180E/EO
D6792-6794	LN89RCPP	LED	3	VW-ET180E/EO
D6795,6796	LN89RCPP	LED	2	
D6797	0A90		1	
		Resistors		
R6781	ERDS2TJ101	100	1	
R6791	ERDS2TJ224	220K	1	VW-ET180E/EO
R6792	ERDS2TJ473	47K	1	VW-ET180E/EO
R6793,6794	ERDS2TJ272	2.7K	2	VW-ET180E/EO
R6795,6796	ERJ8GCYJ821	Chip 1/8W 820	2	
R6797	ERJ8GCYJ181	Chip 1/8W 180	1	
R7301	ERDS2TJ101	100	1	
R7302	ERDS2TJ820	82	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Capacitors		
C7301,7302	ECKF1H332KB	Ceramic 50V 3300P	2	
		Resistor Array		
CR6791	EXBS84332K	3.3Kx4	1	
		Coil		
L6791	TLQ330K126		1	VW-ET180B
		Switches		
SW6791	EVQQS405K		1	
SW6794-6797	EVQQS405K		4	
SW6799	ESD14173		1	
		Crystal Oscillator		
X7301	VSX0099		1	
		Connectors		
P6701	VJP1145	8P	1	
P6702	VJP1229	2P	1	
P6703	VJP1143	5P	1	
		Miscellaneous		
	KL02	Spacer	5	
	VGQ0696	Earth Sheet	1	
WP001,002	ERJ8GCJ0R00	Chip Jumper	2	
	VGT0257	Test Signal SW Knob	1	
	VEP40076E	IR Receiver P.C. Board		
		Unit		
		Integrated Circuit		
IC6501	LPC1373H		1	
		Diode		
D6501	PN313		1	
		Resistors		
R6501	ERDS2TJ102	1K	1	
R6502	ERDS2TJ120	12	1	
R6503	ERDS2TJ154	150K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Capacitors		
C6501	ECEA1CK100	Electrolytic 16V 10	1	
C6502	ECEA1HKR47	Electrolytic 50V 0.47	1	
C6503	ECEA1CK100	Electrolytic 16V 10	1	
C6504	ECQP1472JZ	Mylar 100V 4700P	1	
C6505	ECQM1H183KZ	Mylar 50V 0.018	1	
C6506	ECEA1CK470	Electrolytic 16V 47	1	
		Transformer		
T6501	ELM7Q206A		1	
	VJB40079	Power Transformer P.C. Board		⚠
		Diode		
D151	S4VB20F1		1	⚠
		Capacitors		
C151-153	ECKF1H223ZF	Ceramic 50V 0.022	3	⚠
		Miscellaneous		
	STJ777	AC Cord Clamp Pin	2	⚠
	TJC6320	Fuse Holder	4	⚠
	VGQ0691	AC Cord Bracket	1	⚠
	VJA0111	AC Cord	1	VW-ET180E/EO ⚠
	VJA0112	AC Cord	1	VW-ET180B ⚠
	VJF0017	AC Cord Bushing	1	⚠
	VJP0113	Earth Terminal	1	
	VMX0237	AC Cord Cover	1	⚠
	TMM81416	Binder	1	
	VEP41023A	Power Supply P.C. Board		
		Integrated Circuits		
IC151	AN6564		1	
IC152	AN6912		1	
		Transistors		
Q101	2SB642		1	
Q102	2SD1275		1	(P,Q) ⚠
Q103	2SD1011		1	
Q104	2SD794		1	
Q105	2SD636		1	
Q106	2SD1275		1	(P,Q) ⚠

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
Q107	2SD1011		1	
Q109	2SB788		1	
Q110	2SD636		1	
Q111	2SD636		1	(R,S,T)
Q112	2SB788		1	
Q151	M21C		1	
Q152	2SD1277		1	(P,Q) ⚠
Q154	2SD1277		1	(P,Q) ⚠
Q155	2SC1473		1	(Q,R)
Q156	2SB642		1	
Q157	2SB641		1	
Q158	2SD636		1	(R,S,T)
Q160	2SD637		1	
Q161	2SD639		1	
		Combination Parts		
QR153	DTA114A		1	or UN1111
		Diodes		
D101	MA165		1	
D102	S1S4M		1	
D104	RD16EB1	Zener	1	
D105	MA165		1	
D106	MA161C		1	
D107	MA165		1	
D108	S1S4M		1	
D109	RD6.8EB1	Zener	1	
D111,112	EM1Z		2	⚠
D113	MA27WA		1	
D114	RD5.1EB1	Zener	1	
D115	MA161C		1	
D116	MA165		1	
D118	MA161		1	
D121	MA27WA		1	
D122	RD27EB4	Zener	1	
D123	MA27WA		1	
D124	EM1Z		1	
D152	MA165		1	
D154	MA161C		1	
D155	MA165		1	
D156	S3S4MF4		1	
D157	RD5.1EB1	Zener	1	
D158	RD22EB1	Zener	1	
D160	RD6.8EB1	Zener	1	
D162,163	MA165		2	
D166	MA165		1	
D170	RD22EB1	Zener	1	
D171	RD13EB2	Zener	1	
D172	MA165		1	
D173,174	MA1180		2	
D175	MA165		1	
D177,178	MA165		2	
D179	MA161C		1	
D180-183	MA165		4	
		Resistors		
R102	ERJ8GCYJ102	Chip 1/8W 1K	1	
R103	ERJ8GCYJ183	Chip 1/8W 18K	1	
R104	ERDS2TJ182	1.8K	1	
R105	ERW12VKR68	Wire Wound 1/2W 0.68	1	

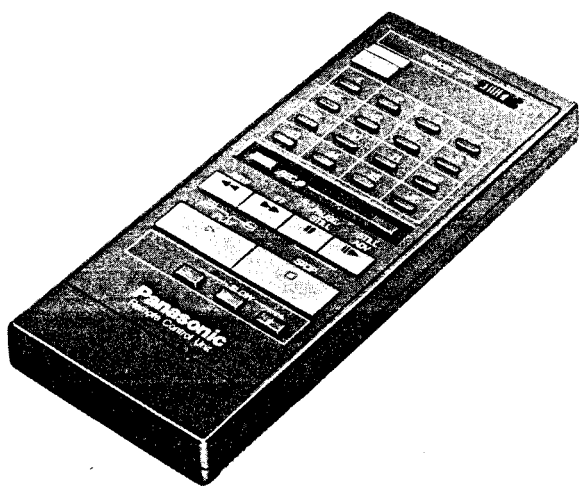
Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
R106	ERJ8GCYJ153	Chip	1/8W	15K	1	
R107,108	ERJ8GCYJ682	Chip	1/8W	6.8K	2	
R109	ERG1SJ223	Metal Oxide	1W	22K	1	
R110	ERJ8GCYJ332	Chip	1/8W	3.3K	1	
R111	ERJ8GCYJ333	Chip	1/8W	33K	1	
R112	ERJ8GCYJ153	Chip	1/8W	15K	1	
R113	ERJ8GCYJ223	Chip	1/8W	22K	1	
R114	ERJ8GCYJ561	Chip	1/8W	560	1	
R115	ERJ8GCYJ152	Metal Oxide	2W	1.5K	1	
R117	ERG12SJ822	Metal Oxide	1/2W	8.2K	1	
R118	ERDS2TJ182			1.8K	1	
R119	ERDS2TJ153			15K	1	
R120,121	ERJ8GCYJ472	Chip	1/8W	4.7K	2	
R122	ERJ8GCYJ153	Chip	1/8W	15K	1	
R123	ERD25TJ223			22K	1	
R126	ERQ14AJ150	Metal	1/4W	15	1	⚠
R127	ERG1SJ331	Metal Oxide	1W	330	1	
R128	ERJ8GCYJ823	Chip	1/8W	82K	1	
R130	ERJ8GCYJ103	Chip	1/8W	10K	1	
R131	ERDS2TJ103			10K	1	
R132	ERJ8GCYJ103	Chip	1/8W	10K	1	
R133	ERDS2TJ105			1M	1	
R135	ERG12SJ222	Meral Oxide	1/2W	2.2K	1	
R136	ERG2SJ392	Metal Oxide	2W	3.9K	1	
R137	ERJ8GCYJ824	Chip	1/8W	820K	1	
R138,139	ERJ8GCYJ473	Chip	1/8W	47K	2	
R140	ERDS2TJ332			3.3K	1	
R141	ERDS2TJ472			4.7K	1	
R142	ERJ8GCYJ104	Chip	1/8W	100K	1	
R143	ERG12SJ472	Metal Oxide	1/2W	4.7K	1	
R144	ERJ8GCYJ473	Chip	1/8W	47K	1	
R145	ERJ8GCYJ560	Chip		56	1	
R151	ERG2SJ332	Metal Oxide	2W	3.3K	1	
R152	ERJ8GCYJ102	Chip	1/8W	1K	1	
R156	ERDS2TJ221			220	1	
R157	ERG3SJ392	Metal Oxide	3W	3.9K	1	
R158	ERDS2TJ681			680	1	
R159	ERJ8GCYJ223	Chip	1/8W	22K	1	
R160,161	ERJ8GCYJ562	Chip	1/8W	5.6K	2	
R162	ERJ8GCJ122	Chip	1/8W	1.2K	1	
R163	ERJ8GCYJ103	Chip	1/8W	10K	1	
R164	ERJ8GCYJ121	Chip	1/8W	120	1	
R165	ERJ8GC0R00	Chip	1/8W	0	1	
R166	ERJ8GCYJ103	Chip	1/8W	10K	1	
R167	ERJ8GCYJ183	Chip	1/8W	18K	1	
R168	ERF2AJR18	Wire Wound	2W	0.18	1	
R169	ERJ8GCYJ101	Chip	1/8W	100	1	
R170	ERJ8GCYJ223	Chip	1/8W	22K	1	
R171	ERJ8GCYJ333	Chip	1/8W	33K	1	
R172	EVNC3AA00B54	Variable		50K	1	
R173	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R174	ERJ8GCYJ103	Chip	1/8W	10K	1	
R175	EVNC3AA00B53	Variable		5K	1	
R176	ERJ8GCYJ103	Chip	1/8W	10K	1	
R178	ERTD2FHL462	Thermistor		4.6K	1	
R179	ERD25TJ103			10K	1	
R180	ERJ8GCYJ562	Chip	1/8W	5.6K	1	
R181	ERJ8GCYJ332	Chip	1/8W	3.3K	1	
R182	ERJ8GCYJ682	Chip	1/8W	6.8K	1	
R184	ERG2SJ152	Metal Oxide	2W	1.5K	1	
R186	ERJ8GCYJ223	Chip	1/8W	22K	1	
R187	ERJ8GCYJ104	Chip	1/8W	100K	1	
R188	ERJ8GCYJ153	Chip	1/8W	15K	1	
R189	ERJ8GCYJ273	Chip	1/8W	27K	1	
R190	ERJ8GCYJ823	Chip	1/8W	82K	1	

Ref. No.	Part No.	Part Name & Description			Pcs / Set	Remarks
R191	ERDS2TJ821			820	1	
R192	ERJ8GCYJ104	Chip	1/8W	100K	1	
R194	ERDS2TJ471			470	1	
R195	ERJ8GCYJ272	Chip	1/8W	2.7K	1	
R196	ERDS2TJ103			10K	1	
R198	ERDS2TJ100			10	1	
R199	ERJ8GCYJ473	Chip	1/8W	47K	1	
R201	ERJ8GCYJ184	Chip	1/8W	180K	1	
R202	ERJ8GCYJ474	Chip	1/8W	470K	1	
R203	ERJ8GCYJ392	Chip	1/8W	3.9K	1	
R204	ERJ8GCYJ223	Chip	1/8W	22K	1	
R205	EVNC3AA00B54	Variable		50K	1	
R206	ERJ8GCYJ123	Chip	1/8W	12K	1	
R207-209	ERJ8GCYJ473	Chip	1/8W	47K	3	
R210	ERJ8GCYJ123	Chip	1/8W	12K	1	
R211	ERD25TJ103			10K	1	
R212	ERJ8GCYJ103	Chip	1/8W	10K	1	
R213	ERJ8GCYJ104	Chip	1/8W	100K	1	
R214	ERDS2TJ221			220	1	
R215	ERDS2TJ105			1M	1	
R216	ERJ8GCYJ560	Chip		56	1	
R217	ERJ8GCYJ393	Chip		39K	1	
R218	ERJ8GCYJ473	Chip		47K	1	
		Capacitors				
C101	ECUX1H103KB	Chip	50V	0.01	1	
C102	ECEA1CU102	Eelctrolytic	16V	1000	1	
C104	ECEA1CU101	Electrolytic	16V	100	1	
C105	ECEA10Z1000	Electrolytic	10V	1000	1	
C109	ECEA2AU221	Electrolytic	100V	220	1	
C110	ECEA2AU101	Electrolytic	100V	100	1	
C113	ECEA0JU101	Electrolytic	6.3V	100	1	
C114,115	ECUX1H102KB	Chip	50V	1000P	1	
C116	ECEA1VU471	Electrolytic	35V	470	1	
C154	ECEB1HU332	Electrolytic	50V	3300	1	
C155	ECEA1EU332	Electrolytic	25V	3300	1	
C156	ECEA0JU101	Electrolytic	6.3V	100	1	
C157	ECEA1EU471	Electrolytic	25V	470	1	
C158	ECEA1AU221	Electrolytic	10V	220	1	
C161	ECKF1H391KB	Ceramic	50V	390P	1	
C163	ECUX1H103KB	Chip	50V	0.01	1	
C164	ECEA1CU100	Electrolytic	16V	10	1	
C167,168	ECUX1H103KB	Chip	50V	0.01	2	
C169	ECEA1HU010	Electrolytic	50V	1	1	
C171	ECQX1H104JZ	Mylar	50V	0.1	1	
C172,173	ECUX1H103KB	Chip	50V	0.01	2	
		Coils				
L101	ELC12E005				1	
L102	ELC12E004				1	
L151	VTQ0017				1	
L152	ELC18E002				1	
L153	VTQ0017				1	
		Connectors				
P101	VJP1145			8P	1	
P102	VJP1146			10P	1	
P103	VJP1144			6P	1	
P104	VJP1188			4P	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Miscellaneous		
	VMC0064	TR Spring	1	
	VMP0417	P.C. Board Angle	1	
	VSC1100	Power Supply Shield	1	
		Case (Top)		
	VSC1150	Power Supply Shield	1	
		Case (Bottom)		
	XTU3+8B	Screw	12	
WB001	ERJ8GC0R00	Chip Jumper	1	
	VJB40075	Back Up P.C. Board		
		Capacitors		
C6795-6797	EECF2R3A3R3	Gold Capacitor 2.3V 3.3F	3	

Wireless Remote Controller

VW-R18E



SPECIFICATIONS

Power:	DC 3 V
Weight:	80 g
Dimensions:	62(W) × 14(H) × 150(D) mm

Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

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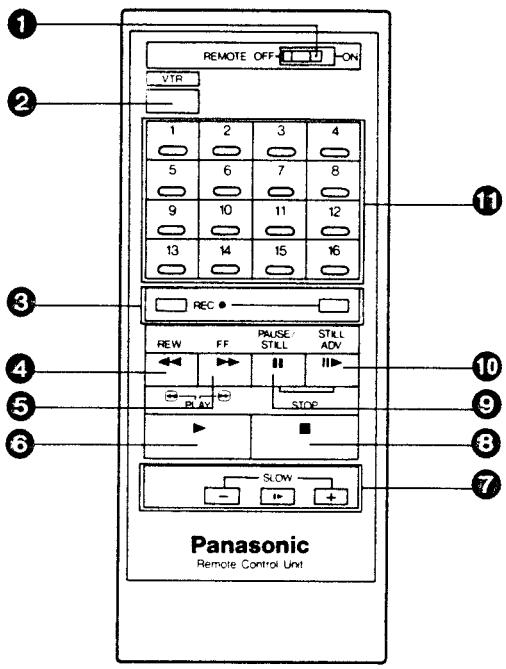
1. CONTROLS AND COMPONENTS



❶ **REMOTE ON/OFF Switch**
Set this to ON when using the unit.

❷ **VTR ON/OFF Button**
Controls VTR power ON/OFF.

❸ **REC Buttons**
Recording begins when both buttons are pressed at the same time.

❹ **Rewind/Review Button**
Press this button to rewind tapes. When this button is kept depressed during playback, the VTR changes over to the Review mode.

❺ **Fast Forward/Cue Button**
Press this button for the Fast Forward.
When this button is kept depressed during playback, the VTR changes over to the cue mode.

❻ **PLAY Button**
Press this button for playback mode.

❼ **Slow-Motion Buttons**
First press the SLOW Button (▮▶) during playback to view a slow-motion picture. Press the "+" or "−" button to increase or decrease the speed of the SLOW-MOTION picture.

−	▮▶	+
1/25 ~ 1/5 ~ 1/3		

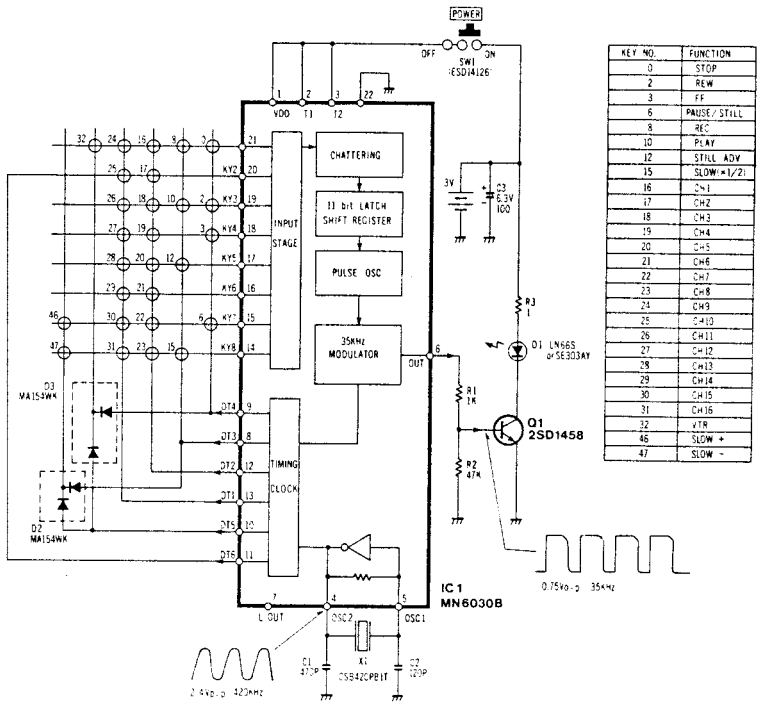
❽ **STOP Button**
Press this button to set the unit in stop mode.

❾ **PAUSE/STILL Button**
Press this button to stop the tape movement temperarily in either recording or playback mode. During playback, super still picture is produced when the pause button is pressed. Press again to release pause.

❿ **STILL ADV Button**
During the still mode, press this button to advance of the picture one frame at a time.

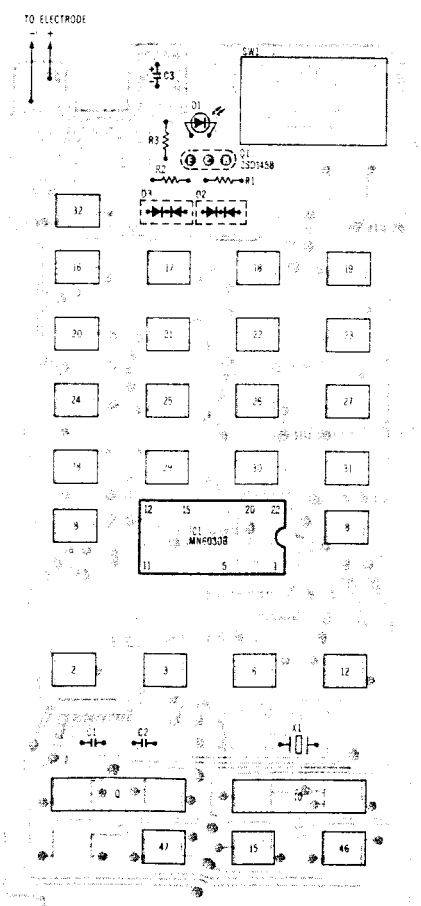
⓫ **Channel Select Buttons**

2. SCHEMATIC DIAGRAM



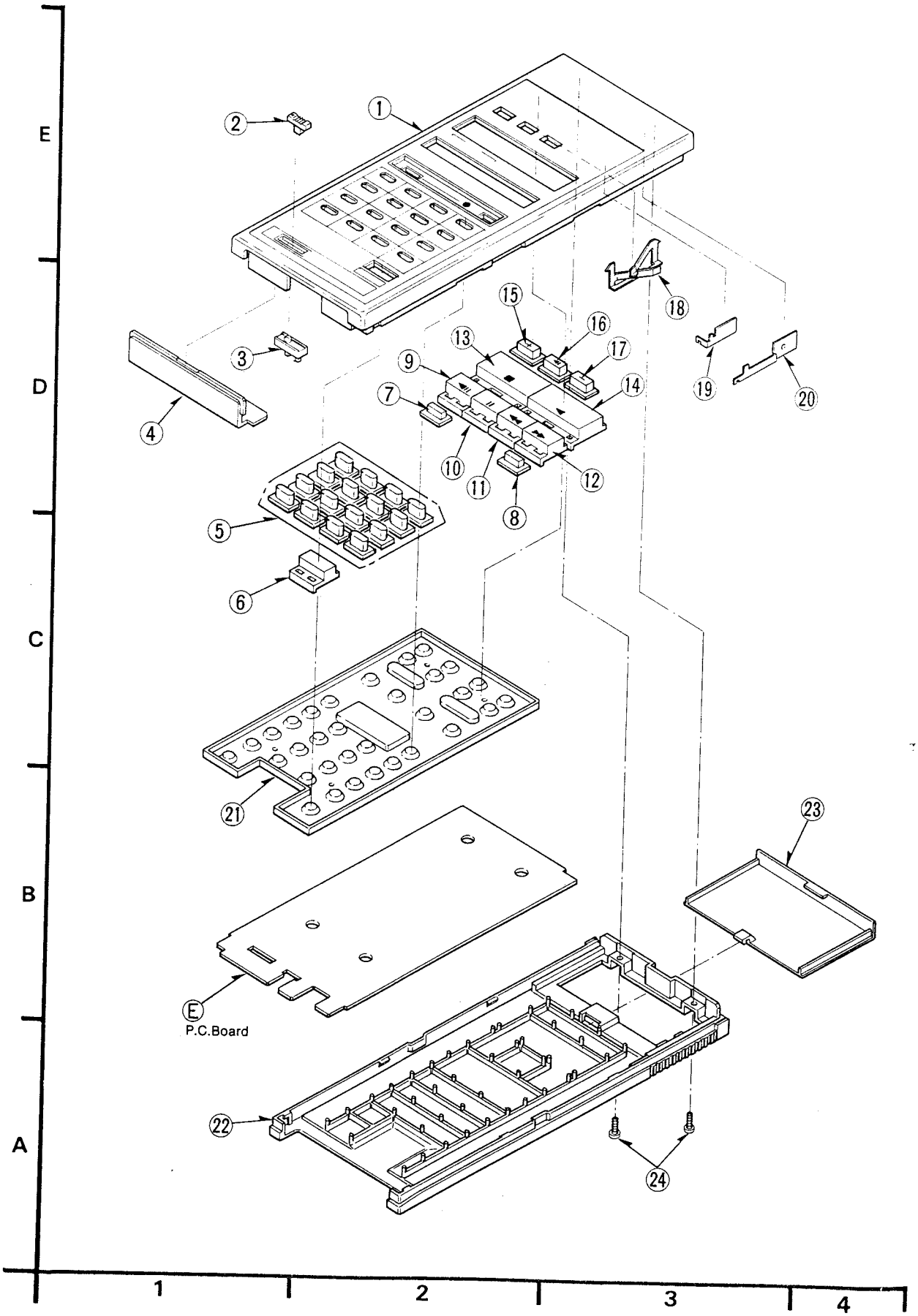
KEY NO.	FUNCTION
0	STOP
2	REW
3	FF
6	PAUSE/STILL
8	REC
10	PLAY
12	STILL ADV
15	SLOW(×1/21)
16	CH1
17	CH2
18	CH3
19	CH4
20	CH5
21	CH6
22	CH7
23	CH8
24	CH9
25	CH10
26	CH11
27	CH12
28	CH13
29	CH14
30	CH15
31	CH16
32	VTR
46	SLOW +
47	SLOW −

3. CIRCUIT BOARD (VEP22021B)

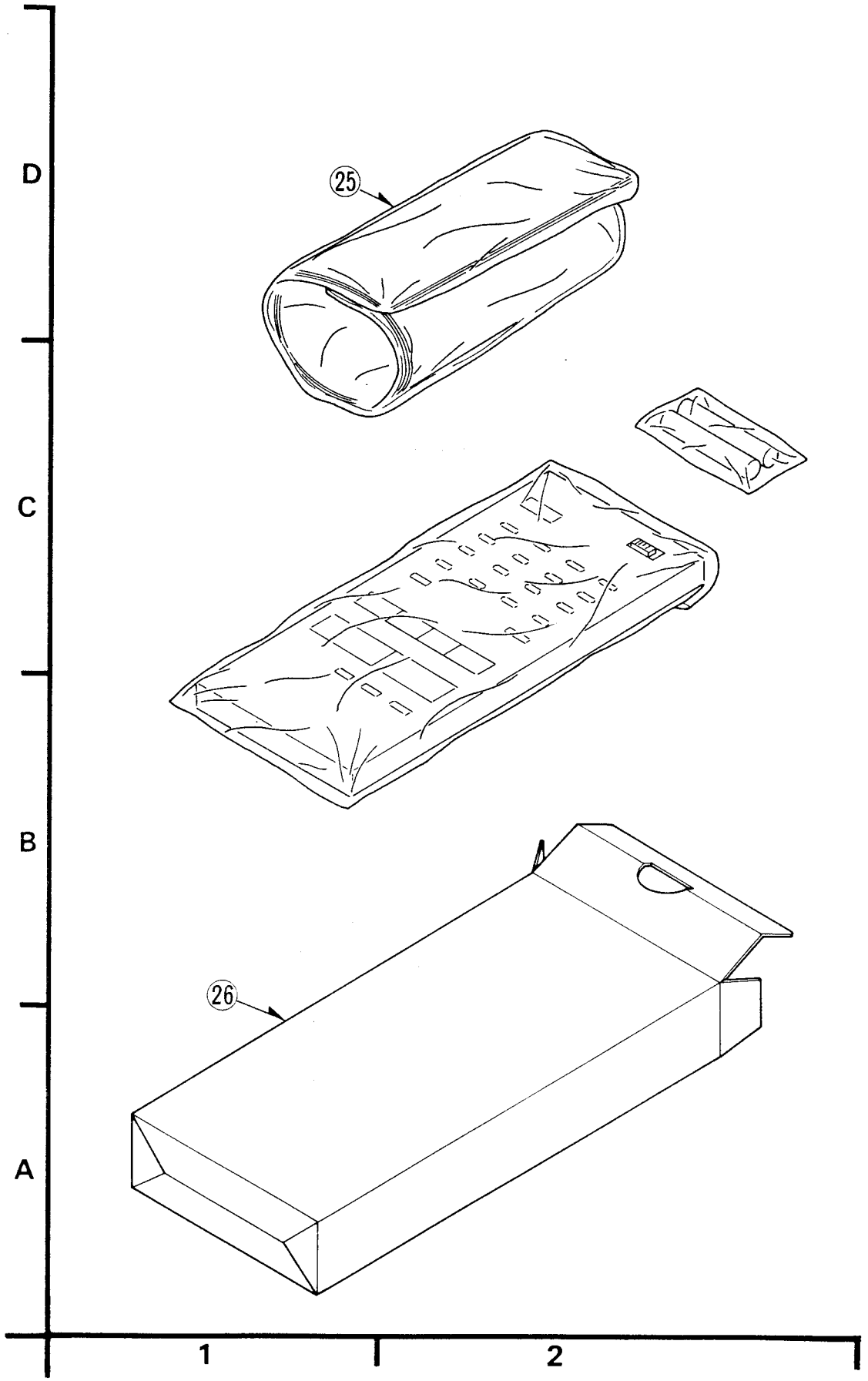


4. EXPLODED VIEWS

❶ REMOTE CONTROL UNIT



❷ PACKING PARTS SECTION



5. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VYK0740	Top Case Unit	1	
2(1)	VGU2213	Power Button	1	
3(1)	VGQ0601	Button Holder	1	
4(1)	VKW0297	Smoke Board	16	
5(1)	VGU1618	CH Select Button	1	
6(1)	VGU1672	VTR Button	1	
7(1)	VGU1619	Rec Button (Black)	1	
8(1)	VGU1211	Rec Button (Red)	1	
9(1)	VGU1667	STILL ADV Button	1	
10(1)	VGU1666	PAUSE/STILL Button	1	
11(1)	VGU1669	FF Button	1	
12(1)	VGU1668	Rew Button	1	
13(1)	VGU1665	Stop Button	1	
14(1)	VGU1664	Play Button	1	
15(1)	VGU1613	Slow (+) Button	1	
16(1)	VGU1612	Slow Button	1	
17(1)	VGU1611	Slow (-) Button	1	
18(1)	VJR0101	Electrode (Common)	1	
19(1)	VJR0099	Electrode (+)	1	
20(1)	VJR0100	Electrode (-)	1	
21(1)	VSP0150	Rubber Contact	1	
22(1)	VYK0741	Bottom Case Unit	1	
23(1)	VKF0340	Battery Cover	1	
24(1)	XTB2+5GFZ	Screw	1	
25(2)	VQF1221	Fan Bag Kit	1	
26(2)	VPK0374	Packing Case	1	

6. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. • Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified.
All resistors are in OHMS (Ω), 1/4W ± 5% carbon. K=1,000Ω. M=1,000KΩ. All capacitors are in MICROFARADS (μF), ± 10% P=μμF.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP22021B	Wireless Remote Controller		
		P.C. Board Unit		
		Integrated Circuit		
IC1	MN6030B		1	
		Transistor		
Q1	2SD1458		1	
		Diodes		
D1	LN66S	LED	1	or SE303AY
D2,3	MA154WK		2	
		Resistors		
R1	ERDS2TJ102	1K	1	
R2	ERDS2TJ473	47K	1	
R3	ERDS2TJ1R0	1	1	
		Capacitors		
C1	ECKF1H471KB	Ceramic 50V 470P	1	
C2	ECKF1A121KB	Ceramic 50V 120P	1	
C3	ECEA0JK101	Electrolytic 6.3V 100	1	
		Crystal Oscillator		
X1	CSB420PB1T		1	
		Switch		
SW1	ESD14126		1	